Wheat Quality Council

Hard Spring Wheat Technical Committee

2009 Crop



February 16 - 18, 2010

Kansas City, MO

Wheat Quality Council

Hard Spring Wheat Technical Committee

2009 Crop



Sponsored by the Wheat Quality Council February 16-18, 2010 Ben Hancock, Executive Vice President Wheat Quality Council P.O. Box 966 Pierre, SD 57501-0966 605-224-5187

Gary A. Hareland, Editor USDA/ARS Hard Red Spring & Durum Wheat Quality Laboratory Cereal Crops Research Unit Red River Valley Agricultural Research Center Dept 7640, Harris Hall, North Dakota State University Fargo, ND 58108-6050 Phone: 701-239-1412 Fax: 701-239-1377 Gary.hareland@ars.usda.gov

Wheat Quality Council

Hard Spring Wheat Technical Committee

Introduction

Breeders' experimental lines of wheat are evaluated for overall quality before being released for commercial production. The Hard Spring Wheat Technical Committee provides milling and baking quality data on breeders' experimental lines of wheat that are annually submitted to the Wheat Quality Council (WQC). The impact is the commercialization of high quality wheat for production and processing.

Thirteen experimental lines of hard spring wheat were grown at up to five locations in 2009 and evaluated for kernel, milling, and bread baking quality against the check variety Glenn. To avoid any bias in the test procedures, code numbers were assigned to the experimental lines and maintained throughout the growing and harvesting of the plots and the milling and baking trials. Samples of wheat were milled at the USDA Hard Red Spring and Durum Wheat Quality Laboratory (WQL), Fargo, ND. Flour samples were shipped to independent laboratories and tested for bread baking quality.

From this report:

The WQC makes no representation regarding the accuracy or conclusiveness of the data developed by and received from the participating laboratories. The data has been scientifically determined and accurately reported from the perspective of the Hard Spring Wheat Technical Committee.

The results relate only to test samples that were volunteered for testing in the 2009 crop year. Test results from other crop years may differ from those reported herein.

The Hard Spring Wheat Technical Committee, by compilation of data and issuance of this report, does not make or intend any general recommendations or conclusions on its part with respect to the desirability of any wheat included in the tests. Mention of a vendor, product, proprietary product, or procedure does not constitute a guarantee or warranty of the vendor, product, or procedure by the Hard Spring Wheat Technical Committee or by cooperating laboratories, and does not imply its approval to the exclusion of other vendors, products, or procedures that may also be suitable. Data reported herein are not to be used in any publication or literature or for advertising or publicity purposes.

Α

	Α	M9	M1	W9	W1
Trait	I. USDA/ARS WQL Data	Glenn		Glenn	
1	Wheat Protein (12%mb)	14.8	13.7	16.2	13.3
2	Flour Protein (12%mb)	14.7	12.9	16.2	12.7
3	Market Value (Score 1-6)	4.4	3.5	4.8	3.4
4	Market Value (Score 1-10)	10	7.4	10	5.8
5	Test Weight (lb/bu)	62.8	59.1	62.4	58.6
6	1000 Kernel Weight (g)	32.5	33.1	28.4	27.8
7	Kernel Size % Large	68	74	27	55
8	Kernel Size % Small	5	3	11	7
9	Wheat Moisture (%)	10.1	10.6	9.4	9.7
10	Wheat Ash (14%mb)	1.19	1.33	1.44	1.39
11	Wheat Falling Number (sec)	388	384	464	579
12	SKCS Hardness Index	72.7	73.1	76.6	70.4
13	Vitreous Kernels (%)	71.0	14.2	98.0	26.0
	Flour Extraction (%)				
14	Tempered Wheat Basis (%)	72.9	73.6	70.6	73.5
15	Total Product Basis (%)	75.9	78.0	73.8	77.1
16	Flour /Bu Wheat (lbs)	48.5	46.2	46.8	46.3
17	Flour Color Brightness (L*)	90.0	89.7	90.2	90.6
18	Flour Color Yellowness (b*)	8.1	8.9	8.9	8.9
19	Flour Moisture (%)	13.4	12.1	13.3	12.7
20	Flour Ash (14%mb)	0.433	0.505	0.458	0.470
21	Flour FN (Malted) (sec)	252	254	247	250
	Farinograph				
22	Water Absorption (500bu)	66.1	65.5	66.5	61.7
23	Water Absorption (14%mb)		63.3	65.7	60.2
24	Arrival Time (min)		3.5	5.8	2.8
25	Peak Time (min)		6.2	13.7	6.2
26	Dough Stability (min)		5.2	14.1	9.3
27	MTI (bu)		48.0	12.0	27.0
28	TTB (min)		8.9	20.0	12.0
	II. Cooperator Results				
29	Bake Absorption (Ave %)	65.2	63.7	65.8	61.3
30	Loaf Volume (% of Check)	0012	88.0	5010	86.7
			0010		0011

Trait	A II. Cooperator Results	M9 Glenn	M1	W9 Glenn	W1
31	Mixing Requirement	3.5	2.8	4.1	3.6
	5 Very Long				
	4 Long				
	3 Medium				
	2 Short				
32	1 Very Short	4.0	3.1	3.9	3.5
32	Dough Characteristics <u>5</u> Bucky-Tough	4.0	3.1	3.9	3.5
	4 Strong-Elastic				
	3 Medium-Pliable				
	2 Mellow-Very Pliable				
	1 Weak-Short or Sticky				
33	Mixing Tolerance		1.8		2.4
	5 Much More Tolerance Than Check				
	4 More Tolerance Than Check				
	3 Tolerance Equivalent To Check				
	2 Less Tolerance Than Check				
	1 Much Less Tolerance Than Check				
34	Internal Crumb Color		2.7		3.8
	5 Much Brighter Than Check				
	4 Brighter Than Check				
	3 Equivalent To Check				
	2 Poorer Than Check				
25	1 Much Poorer Than Check Internal Grain and Texture		3.4		3.6
35	5 Much Better Than Check		3.4		3.0
	4 Better Than Check				
	3 Equivalent To Check				
	2 Poorer Than Check				
	1 Much Poorer Than Check				
	III. Cooperator Evaluation				
	Quality Trait 1-2: Protein		2.0		1.3
	5 Much Better Than Check				
	4 Better Than Check				
	3 Equivalent To Check				
	2 Poorer Than Check				
	1 Much Poorer Than Check				
	Quality Trait 3-21: Milling <u>5</u> Much Better Than Check		2.8		3.1
	4 Better Than Check				
	3 Equivalent To Check				
	2 Poorer Than Check				
	1 Much Poorer Than Check				
	Quality Trait 22-35: Baking		2.0		1.8
	5 Much Better Than Check				
	4 Better Than Check				
	3 Equivalent To Check				
	2 Poorer Than Check				
	1 Much Poorer Than Check				
	Quality Trait 1-35: Overall Comparison		2.0		2.3
	5 Much Better Than Check				
	4 Better Than Check				
	3 Equivalent To Check				
	2 Poorer Than Check 1 Much Poorer Than Check				
	I Much Poorer Than Check				

01S0263-28

T	01S0263-28	B9	B2	C9	C2	M9	M2
	I. USDA/ARS WQL Data	Glenn	44.0	Glenn	40.0	Glenn	447
1	Wheat Protein (12%mb)	15.5	14.8	14.5	13.6	14.8	14.7
2	Flour Protein (12%mb)	15.2	14.4	14.0	13.3	14.7	14.2
3	Market Value (Score 1-6)	4.8	4.4	4.2	3.0	4.4	4.0
4	Market Value (Score 1-10)	10	8.6	10	7.8	10	9.0
5	Test Weight (Ib/bu)	63.3	62.2	63.6	59.7	62.8	61.0
6	1000 Kernel Weight (g)	35.6	33.4	28.3	29.6	32.5	29.7
7	Kernel Size % Large	79	75	47	46	68	57
8	Kernel Size % Small	3	5	9	11	5	8
9	Wheat Moisture (%)	10.8	10.7	10.2	9.8	10.1	9.6
10	Wheat Ash (14%mb)	1.57	1.58	1.54	1.59	1.19	1.30
11	Wheat Falling Number (sec)	400	457	418	371	388	396
12	SKCS Hardness Index	83.7	77.8	88.6	87.4	72.7	64.7
13	Vitreous Kernels (%)	92.0	59.3	90.2	65.6	71.0	5.4
	Flour Extraction (%)						
14	Tempered Wheat Basis (%)	69.9	70.1	69.4	72.4	72.9	73.1
15	Total Product Basis (%)	73.7	73.5	73.1	76.3	75.9	76.8
16	Flour /Bu Wheat (lbs)	46.2	45.7	46.6	45.9	48.5	47.8
17	Flour Color Brightness (L*)	89.8	89.7	89.9	89.1	90.0	89.5
18	Flour Color Yellowness (b*)	8.2	10.3	8.4	10.3	8.1	10.4
19	Flour Moisture (%)	13.3	13.1	12.5	12.5	13.4	12.8
20	Flour Ash (14%mb)	0.518	0.529	0.473	0.615	0.433	0.454
21	Flour FN (Malted) (sec)	251	251	252	258	252	269
	Farinograph						
22	Water Absorption (500bu)	68.8	67.6	66.1	63.9	66.1	65.7
23	Water Absorption (14%mb)	68.0	66.6	64.4	62.2	65.4	64.3
24	Arrival Time (min)	3.9	4.2	2.2	3.0	4.7	5.0
25	Peak Time (min)	8.0	6.8	6.2	6.5	9.7	7.8
26	Dough Stability (min)	10.1	7.0	10.5	9.0	11.5	8.7
27	MTI (bu)	26.0	37.0	25.0	28.0	25.0	21.0
28	TTB (min)	13.6	11.3	12.0	11.1	15.2	14.2
	II. Cooperator Results						
29	Bake Absorption (Ave %)	66.7	65.6	64.9	63.0	65.2	64.3
30	Loaf Volume (% of Check)	5017	98.3	0.110	95.4	0011	98.2
			00.0		30.7		30.2

01S0263-28

Trait	01S0263-28 II. Cooperator Results	B9 Glenn	B2	C9 Glenn	C2	M9 Glenn	M2
31	Mixing Requirement	3.7	2.8	4.0	3.5	3.5	2.9
	5 Very Long						
	4 Long						
	3 Medium						
	2 Short						
	1 Very Short						
32	Dough Characteristics	4.0	3.3	3.8	3.4	4.0	3.5
	5 Bucky-Tough						
	4 Strong-Elastic						
	3 Medium-Pliable						
	2 Mellow-Very Pliable						
33	1 Weak-Short or Sticky		2.3		2.9		2.3
33	Mixing Tolerance 5 Much More Tolerance Than Check		2.3		2.9		2.3
	4 More Tolerance Than Check						
	3 Tolerance Equivalent To Check						
	2 Less Tolerance Than Check						
	1 Much Less Tolerance Than Check						
34	Internal Crumb Color		2.7		2.5		2.6
	5 Much Brighter Than Check		2.1		2.0		2.0
	4 Brighter Than Check						
	3 Equivalent To Check						
	2 Poorer Than Check						
	1 Much Poorer Than Check						
35	Internal Grain and Texture		3.5		3.5		3.7
	5 Much Better Than Check						
	4 Better Than Check						
	3 Equivalent To Check						
	2 Poorer Than Check						
	1 Much Poorer Than Check						
	III. Cooperator Evaluation						
	Quality Trait 1-2: Protein		2.4		2.2		2.8
	5 Much Better Than Check						
	4 Better Than Check						
	3 Equivalent To Check						
	2 Poorer Than Check						
	1 Much Poorer Than Check				~ -		
	Quality Trait 3-21: Milling		2.8		2.7		2.5
	5 Much Better Than Check						
	4 Better Than Check						
	3 Equivalent To Check 2 Poorer Than Check						
	1 Much Poorer Than Check						
	Quality Trait 22-35: Baking		2.8		2.4		2.8
	5 Much Better Than Check		2.0		2.4		2.0
	4 Better Than Check						
	3 Equivalent To Check						
	2 Poorer Than Check						
	1 Much Poorer Than Check						
	Quality Trait 1-35: Overall Comparison		2.7		2.3		2.9
	5 Much Better Than Check						
	4 Better Than Check						
	3 Equivalent To Check						
	2 Poorer Than Check						
	1 Much Poorer Than Check						

Trait	ND811 I. USDA/ARS WQL Data	C9 Glenn	C3	K9 Glenn	K3	M9 Glenn	М3	W9 Glenn	W3
1	Wheat Protein (12%mb)	14.5	13.9	14.1	11.1	14.8	14.0	16.2	14.4
2	Flour Protein (12%mb)	14.0	13.5	13.3	10.3	14.7	13.5	16.2	14.0
3	Market Value (Score 1-6)	4.2	4.2	3.7	3.0	4.4	4.0	4.8	3.9
4	Market Value (Score 1-10)	10	8.6	10	6.2	10	8.6	10	7.4
5	Test Weight (Ib/bu)	63.6	62.0	64.5	62.3	62.8	60.1	62.4	59.9
6	1000 Kernel Weight (g)	28.3	32.8	33.4	36.0	32.5	34.0	28.4	29.0
7	Kernel Size % Large	47	77	71	83	68	43	27	47
8	Kernel Size % Small	9	5	4	3	5	5	11	8
9	Wheat Moisture (%)	10.2	10.9	9.7	9.6	10.1	10.6	9.4	10.0
10	Wheat Ash (14%mb)	1.54	1.40	1.47	1.49	1.19	1.15	1.44	1.38
11	Wheat Falling Number (sec)	418	454	312	322	388	421	464	479
12	SKCS Hardness Index	88.6	78.8	87.5	83.1	72.7	74.0	76.6	77.3
13	Vitreous Kernels (%)	90.2	65.6	91.2	51.5	71.0	27.3	98.0	88.4
	Flour Extraction (%)								
14	Tempered Wheat Basis (%)	69.4	72.4	68.8	69.2	72.9	72.2	70.6	69.8
15	Total Product Basis (%)	73.1	76.0	72.0	72.7	75.9	75.4	73.8	74.1
16	Flour /Bu Wheat (lbs)	46.6	46.9	47.2	46.0	48.5	45.8	46.8	44.6
17	Flour Color Brightness (L*)	89.9	89.7	90.2	90.0	90.0	89.9	90.2	90.5
18	Flour Color Yellowness (b*)	8.4	9.2	7.5	9.3	8.1	9.4	8.9	9.3
19	Flour Moisture (%)	12.5	13.0	13.2	13.1	13.4	13.5	13.3	11.9
20	Flour Ash (14%mb)	0.473	0.499	0.468	0.484	0.433	0.390	0.458	0.479
21	Flour FN (Malted) (sec)	252	256	259	248	252	250	247	249
	Farinograph								
22	Water Absorption (500bu)	66.1	64.1	68.6	65.4	66.1	65.0	66.5	65.9
23	Water Absorption (14%mb)	64.4	62.9	67.7	64.4	65.4	64.4	65.7	63.5
24	Arrival Time (min)	2.2	3.2	2.0	1.5	4.7	4.2	5.8	3.2
25	Peak Time (min)	6.2	5.7	3.8	2.3	9.7	7.2	13.7	8.2
26	Dough Stability (min)	10.5	7.8	6.1	3.1	11.5	9.7	14.1	11.4
27	MTI (bu)	25.0	31.0	36.0	51.0	25.0	19.0	12.0	29.0
28	TTB (min)	12.0	10.3	8.1	4.5	15.2	14.3	20.0	13.8
29	II. Cooperator Results Bake Absorption (Ave %)	64.9	62.9	66.6	63.2	65.2	64.2	65.8	64.7
	• • •	04.9		0.00		05.2		05.0	
30	Loaf Volume (% of Check)		97.7		90.6		96.5		89.8

Trait	ND811 II. Cooperator Results	C9 Glenn	С3	K9 Glenn	K3	M9 Glenn	М3	W9 Glenn	W3
31	Mixing Requirement	4.0	3.3	3.5	2.4	3.5	3.1	4.1	3.5
	5 Very Long								
	4 Long								
	3 Medium								
	2 Short								
	1 Very Short								
32	Dough Characteristics	3.8	3.4	4.0	2.8	4.0	3.5	3.9	3.7
	5 Bucky-Tough	0.0	••••				0.0	0.0	•
	4 Strong-Elastic								
	3 Medium-Pliable								
	2 Mellow-Very Pliable								
	1 Weak-Short or Sticky								
33	Mixing Tolerance		2.4		1.6		2.3		2.7
	5 Much More Tolerance Than Check		2.7				2.0		2.7
	4 More Tolerance Than Check								
	3 Tolerance Equivalent To Check								
	2 Less Tolerance Than Check								
	1 Much Less Tolerance Than Check								
34	Internal Crumb Color		2.8		2.2		2.9		3.1
54	5 Much Brighter Than Check		2.0		2.2		2.5		5.1
	4 Brighter Than Check								
	3 Equivalent To Check								
	2 Poorer Than Check								
	1 Much Poorer Than Check								
35	Internal Grain and Texture		3.3		3.1		3.2		3.5
35	5 Much Better Than Check		3.3		3.1		J.Z		3.5
	4 Better Than Check								
	3 Equivalent To Check								
	2 Poorer Than Check								
	1 Much Poorer Than Check								
	III. Cooperator Evaluation								
	-		2.2		1.2		24		2
	Quality Trait 1-2: Protein <u>5</u> Much Better Than Check		2.2		1.2		2.4		2
	4 Better Than Check								
	3 Equivalent To Check 2 Poorer Than Check								
	1 Much Poorer Than Check								
			27		2.9		27		2.0
	Quality Trait 3-21: Milling		3.7		2.9		2.7		2.9
	5 Much Better Than Check								
	4 Better Than Check								
	3 Equivalent To Check								
	2 Poorer Than Check								
	1 Much Poorer Than Check		2 5		4 5		27		2.3
	Quality Trait 22-35: Baking		2.5		1.5		2.7		2.3
	5 Much Better Than Check								
	4 Better Than Check								
	3 Equivalent To Check								
	2 Poorer Than Check								
	1 Much Poorer Than Check		27		4.5		27		27
	Quality Trait 1-35: Overall Comparison		2.7		1.5		2.7		2.7
	5 Much Better Than Check								
	4 Better Than Check								
	3 Equivalent To Check								
	2 Poorer Than Check								
	1 Much Poorer Than Check								

CA905-776

Trait	CA905-776 I. USDA/ARS WQL Data	C9 Glenn	C4
1	Wheat Protein (12%mb)	14.5	14.4
2	Flour Protein (12%mb)	14.0	13.9
3	Market Value (Score 1-6)	4.2	3.5
4	Market Value (Score 1-10)	10	8.8
5	Test Weight (lb/bu)	63.6	61.4
6	1000 Kernel Weight (g)	28.3	29.5
7	Kernel Size % Large	47	55
8	Kernel Size % Small	9	8
9	Wheat Moisture (%)	10.2	10.1
10	Wheat Ash (14%mb)	1.54	1.52
11	Wheat Falling Number (sec)	418	380
12	SKCS Hardness Index	88.6	74.2
13	Vitreous Kernels (%)	90.2	58.4
	Flour Extraction (%)		
14	Tempered Wheat Basis (%)	69.4	70.9
15	Total Product Basis (%)	73.1	74.7
16	Flour /Bu Wheat (Ibs)	46.6	45.9
17	Flour Color Brightness (L*)	89.9	89.5
18	Flour Color Yellowness (b*)	8.4	10.7
19	Flour Moisture (%)	12.5	12.6
20	Flour Ash (14%mb)	0.473	0.530
21	Flour FN (Malted) (sec)	252	254

Farinograph

22	Water Absorption (500bu)	66.1	65.8
23	Water Absorption (14%mb)	64.4	64.2
24	Arrival Time (min)	2.2	4.7
25	Peak Time (min)	6.2	7.3
26	Dough Stability (min)	10.5	7.7
27	MTI (bu)	25.0	31.0
28	TTB (min)	12.0	12.3

II. Cooperator Results29Bake Absorption (Ave %)30Loaf Volume (% of Check)99.4

	CA905-776	C9	C4
Trait	II. Cooperator Results	Glenn	
31	Mixing Requirement	4.0	3.2
	5 Very Long		
	4 Long		
	3 Medium		
	2 Short		
	1 Very Short		
32	Dough Characteristics	3.8	3.5
	5 Bucky-Tough	0.0	0.0
	4 Strong-Elastic		
	3 Medium-Pliable		
	2 Mellow-Very Pliable		
	1 Weak-Short or Sticky		
33	Mixing Tolerance		2.7
33	5 Much More Tolerance Than Check		2.1
	4 More Tolerance Than Check		
	3 Tolerance Equivalent To Check		
	2 Less Tolerance Than Check		
	1 Much Less Tolerance Than Check		
34	Internal Crumb Color		2.6
	5 Much Brighter Than Check		
	4 Brighter Than Check		
	3 Equivalent To Check		
	2 Poorer Than Check		
	1 Much Poorer Than Check		
35	Internal Grain and Texture		3.2
	5 Much Better Than Check		
	4 Better Than Check		
	3 Equivalent To Check		
	2 Poorer Than Check		
	1 Much Poorer Than Check		
	III. Cooperator Evaluation		
	Quality Trait 1-2: Protein		2.9
	5 Much Better Than Check		
	4 Better Than Check		
	3 Equivalent To Check		
	2 Poorer Than Check		
	1 Much Poorer Than Check		
	Quality Trait 3-21: Milling		2.8
	5 Much Better Than Check		
	4 Better Than Check		
	3 Equivalent To Check		
	2 Poorer Than Check		
	1 Much Poorer Than Check		
	Quality Trait 22-35: Baking		3.0
	5 Much Better Than Check		5.0
	4 Better Than Check		
	3 Equivalent To Check 2 Poorer Than Check		
	2 Poorer Than Check 1 Much Poorer Than Check		
	Quality Trait 1-35: Overall Comparison		3.1
	5 Much Better Than Check		
	4 Better Than Check		
	3 Equivalent To Check		
	2 Poorer Than Check		
	1 Much Poorer Than Check		

SD3948

Trait	SD3948 I. USDA/ARS WQL Data	B9 Glenn	В5	C9 Glenn	C5	K9 Glenn	K5	M9 Glenn	М5
1	Wheat Protein (12%mb)	15.5	14.6	14.5	13.7	14.1	13.1	14.8	14.8
2	Flour Protein (12%mb)	15.2	14.3	14.0	13.2	13.3	12.4	14.7	14.0
3	Market Value (Score 1-6)	4.8	4.6	4.2	3.9	3.7	4.2	4.4	4.5
4	Market Value (Score 1-10)	10	9.0	10	9.0	10	8.4	10	10
5	Test Weight (lb/bu)	63.3	62.0	63.6	61.8	64.5	63.2	62.8	61.9
6	1000 Kernel Weight (g)	35.6	35.7	28.3	32.2	33.4	35.7	32.5	34.8
7	Kernel Size % Large	79	81	47	65	71	81	68	78
8	Kernel Size % Small	3	4	9	5	4	3	5	3
9	Wheat Moisture (%)	10.8	10.8	10.2	10.3	9.7	9.6	10.1	10.6
10	Wheat Ash (14%mb)	1.57	1.51	1.54	1.48	1.47	1.46	1.19	1.19
11	Wheat Falling Number (sec)	400	453	418	417	312	399	388	405
12	SKCS Hardness Index	83.7	83.6	88.6	83.0	87.5	81.0	72.7	74.3
13	Vitreous Kernels (%)	92.0	65.0	90.2	41.6	91.2	54.5	71.0	11.4
	Flour Extraction (%)								
14	Tempered Wheat Basis (%)	69.9	71.5	69.4	71.9	68.8	70.5	72.9	72.9
15	Total Product Basis (%)	73.7	74.5	73.1	75.2	72.0	73.7	75.9	75.2
16	Flour /Bu Wheat (lbs)	46.2	46.7	46.6	46.7	47.2	47.3	48.5	47.8
17	Flour Color Brightness (L*)	89.8	90.0	89.9	89.3	90.2	90.1	90.0	89.7
18	Flour Color Yellowness (b*)	8.2	9.0	8.4	9.2	7.5	8.3	8.1	8.7
19	Flour Moisture (%)	13.3	13.6	12.5	13.0	13.2	13.5	13.4	12.9
20	Flour Ash (14%mb)	0.518	0.516	0.473	0.528	0.468	0.478	0.433	0.475
21	Flour FN (Malted) (sec)	251	252	252	259	259	256	252	258
	Farinograph								
22	Water Absorption (500bu)	68.8	66.9	66.1	64.9	68.6	65.1	66.1	64.3
23	Water Absorption (14%mb)	68.0	66.4	64.4	63.7	67.7	64.5	65.4	63.0
24	Arrival Time (min)	3.9	3.5	2.2	2.2	2.0	1.9	4.7	3.7
25	Peak Time (min)	8.0	6.7	6.2	5.8	3.8	3.7	9.7	6.0
26	Dough Stability (min)	10.1	7.1	10.5	6.8	6.1	6.2	11.5	6.4
27	MTI (bu)	26.0	35.0	25.0	39.0	36.0	35.0	25.0	38.0
28	TTB (min)	13.6	10.5	12.0	9.3	8.1	8.2	15.2	10.1
20		13.0	10.5	12.0	9.5	0.1	0.2	13.2	10.1
	II. Cooperator Results								
29	Bake Absorption (Ave %)	66.7	65.2	64.9	63.8	66.6	64.1	65.2	63.4
30	Loaf Volume (% of Check)		99.6		95.8		93.2		94.0
	· /								

SD3948

Trait	SD3948 II. Cooperator Results	B9 Glenn	B5	C9 Glenn	C5	K9 Glenn	K5	M9 Glenn	M5
31	Mixing Requirement	3.7	3.0	4.0	2.6	3.5	2.8	3.5	2.7
	5 Very Long								
	4 Long								
	3 Medium								
	2 Short								
	1 Very Short								
32	Dough Characteristics	4.0	3.5	3.8	3.7	4.0	3.5	4.0	3.3
	5 Bucky-Tough								
	4 Strong-Elastic								
	3 Medium-Pliable								
	2 Mellow-Very Pliable								
	1 Weak-Short or Sticky								
33	Mixing Tolerance		2.4		2.3		2.6		1.8
	5 Much More Tolerance Than Check								
	4 More Tolerance Than Check								
	3 Tolerance Equivalent To Check								
	2 Less Tolerance Than Check								
	1 Much Less Tolerance Than Check								
34	Internal Crumb Color		3.3		3.1		2.7		3.2
••	5 Much Brighter Than Check		0.0		0.1				0.2
	4 Brighter Than Check								
	3 Equivalent To Check								
	2 Poorer Than Check								
	1 Much Poorer Than Check								
35	Internal Grain and Texture		3.6		3.5		3.5		3.5
55	5 Much Better Than Check		5.0		5.5		5.5		5.5
	4 Better Than Check								
	3 Equivalent To Check								
	2 Poorer Than Check								
	1 Much Poorer Than Check								
	III. Cooperator Evaluation								
	Quality Trait 1-2: Protein		2.4		2.3		2.0		2.8
	5 Much Better Than Check		2.4		2.5		2.0		2.0
	4 Better Than Check								
	3 Equivalent To Check								
	2 Poorer Than Check								
	2 Poorer Than Check 1 Much Poorer Than Check								
			3.2		2.2		2.2		2.0
	Quality Trait 3-21: Milling <u>5</u> Much Better Than Check		3.2		3.3		3.3		3.0
	4 Better Than Check								
	3 Equivalent To Check 2 Poorer Than Check								
	1 Much Poorer Than Check		2.4		2.0				2.0
	Quality Trait 22-35: Baking		2.4		2.9		2.3		2.8
	5 Much Better Than Check								
	4 Better Than Check								
	3 Equivalent To Check								
	2 Poorer Than Check 1 Much Poorer Than Check								
			0.7		2.0		2.0		2.0
	Quality Trait 1-35: Overall Comparison		2.7		2.8		2.6		2.8
	5 Much Better Than Check								
	4 Better Than Check								
	3 Equivalent To Check								
	2 Poorer Than Check								
	1 Much Poorer Than Check								

	В	M9	M6	W9	W6
Trait	I. USDA/ARS WQL Data	Glenn		Glenn	
1	Wheat Protein (12%mb)	14.8	12.8	16.2	12.9
2	Flour Protein (12%mb)	14.7	11.8	16.2	12.0
3	Market Value (Score 1-6)	4.4	3.4	4.8	3.4
4	Market Value (Score 1-10)	10	6.4	10	6.2
5	Test Weight (lb/bu)	62.8	59.8	62.4	59.4
6	1000 Kernel Weight (g)	32.5	29.6	28.4	26.8
7	Kernel Size % Large	68	46	27	25
8	Kernel Size % Small	5	10	11	13
9	Wheat Moisture (%)	10.1	10.1	9.4	9.7
10	Wheat Ash (14%mb)	1.19	1.17	1.44	1.36
11	Wheat Falling Number (sec)	388	407	464	495
12	SKCS Hardness Index	72.7	66.2	76.6	61.2
13	Vitreous Kernels (%)	71.0	6.7	98.0	7.5
	Flour Extraction (%)				
14	Tempered Wheat Basis (%)	72.9	73.4	70.6	70.8
15	Total Product Basis (%)	75.9	76.6	73.8	74.3
16	Flour /Bu Wheat (lbs)	48.5	46.5	46.8	44.4
17	Flour Color Brightness (L*)	90.0	90.0	90.2	90.8
18	Flour Color Yellowness (b*)	8.1	8.5	8.9	8.6
19	Flour Moisture (%)	13.4	12.9	13.3	12.3
20	Flour Ash (14%mb)	0.433	0.490	0.458	0.476
21	Flour FN (Malted) (sec)	252	251	247	241
	Farinograph				
22	Water Absorption (500bu)	66.1	61.3	66.5	59.8
23	Water Absorption (14%mb)	65.4	60.0	65.7	57.9
24	Arrival Time (min)	4.7	2.8	5.8	1.8
25	Peak Time (min)	9.7	5.8	13.7	7.2
26	Dough Stability (min)	11.5	7.6	14.1	17.1
27	MTI (bu)	25.0	33.0	12.0	18.0
28	TTB (min)	15.2	10.5	20.0	16.6
	II. Cooperator Results				
29	Bake Absorption (Ave %)	65.2	60.5	65.8	60.2
29 30	Loaf Volume (% of Check)	05.2	89.5	05.0	86.2
30			09.0		00.2

Trait	B II. Cooperator Results	M9 Glenn	M6	W9 Glenn	W6
31	Mixing Requirement	3.5	2.4	4.1	4.2
	5 Very Long				
	4 Long				
	3 Medium				
	2 Short				
	1 Very Short				
32	Dough Characteristics	4.0	2.7	3.9	3.4
	5 Bucky-Tough 4 Strong-Elastic				
	3 Medium-Pliable				
	2 Mellow-Very Pliable				
	1 Weak-Short or Sticky				
33	Mixing Tolerance		1.9		3.0
	5 Much More Tolerance Than Check				
	4 More Tolerance Than Check				
	3 Tolerance Equivalent To Check				
	2 Less Tolerance Than Check				
	1 Much Less Tolerance Than Check				
34	Internal Crumb Color		2.6		3.2
	5 Much Brighter Than Check				
	4 Brighter Than Check				
	3 Equivalent To Check 2 Poorer Than Check				
	2 Poorer Than Check 1 Much Poorer Than Check				
35	Internal Grain and Texture		2.9		3.3
00	5 Much Better Than Check		2.5		0.0
	4 Better Than Check				
	3 Equivalent To Check				
	2 Poorer Than Check				
	1 Much Poorer Than Check				
	III. Cooperator Evaluation				
	Quality Trait 1-2: Protein		1.3		1.5
	5 Much Better Than Check				
	4 Better Than Check 3 Equivalent To Check				
	2 Poorer Than Check				
	1 Much Poorer Than Check				
	Quality Trait 3-21: Milling		2.3		2.4
	5 Much Better Than Check				
	4 Better Than Check				
	3 Equivalent To Check				
	2 Poorer Than Check				
	1 Much Poorer Than Check				
	Quality Trait 22-35: Baking		2.0		2.0
	5 Much Better Than Check				
	4 Better Than Check				
	3 Equivalent To Check 2 Poorer Than Check				
	2 Poorer Than Check 1 Much Poorer Than Check				
	Quality Trait 1-35: Overall Comparison		1.9		2.1
	5 Much Better Than Check				
	4 Better Than Check				
	3 Equivalent To Check				
	2 Poorer Than Check				
	1 Much Poorer Than Check				

Tue:4	ND810	C9	C7	K9 Clann	K7	W9	W7
	I. USDA/ARS WQL Data	Glenn		Glenn	40.0	Glenn	445
1	Wheat Protein (12%mb)	14.5	14.4	14.1	13.9	16.2	14.5
2	Flour Protein (12%mb)	14.0	13.7	13.3	13.0	16.2	14.0
3	Market Value (Score 1-6)	4.2	4.1	3.7	4.3	4.8	3.9
4	Market Value (Score 1-10)	10	9.6	10	9.6	10	7.0
5	Test Weight (lb/bu)	63.6	61.7	64.5	63.0	62.4	60.2
6	1000 Kernel Weight (g)	28.3	28.6	33.4	32.1	28.4	25.7
7	Kernel Size % Large	47	49	71	71	27	22
8	Kernel Size % Small	9	9	4	5	11	17
9	Wheat Moisture (%)	10.2	9.6	9.7	9.3	9.4	9.8
10	Wheat Ash (14%mb)	1.54	1.47	1.47	1.41	1.44	1.33
11	Wheat Falling Number (sec)	418	479	312	431	464	477
12	SKCS Hardness Index	88.6	81.8	87.5	87.0	76.6	81.7
13	Vitreous Kernels (%)	90.2	61.4	91.2	50.7	98.0	89.1
	Flour Extraction (%)						
14	Tempered Wheat Basis (%)	69.4	70.3	68.8	68.1	70.6	70.0
15	Total Product Basis (%)	73.1	73.6	72.0	71.2	73.8	73.8
16	Flour /Bu Wheat (lbs)	46.6	46.3	47.2	45.9	46.8	44.9
17	Flour Color Brightness (L*)	89.9	89.0	90.2	89.6	90.2	89.9
18	Flour Color Yellowness (b*)	8.4	8.5	7.5	7.7	8.9	9.0
19	Flour Moisture (%)	12.5	12.9	13.2	13.3	13.3	12.8
20	Flour Ash (14%mb)	0.473	0.504	0.468	0.476	0.458	0.471
21	Flour FN (Malted) (sec)	252	253	259	276	247	264
	Farinograph						
22	Water Absorption (500bu)	66.1	67.0	68.6	69.1	66.5	66.9
23	Water Absorption (14%mb)	64.4	65.7	67.7	68.3	65.7	65.5
24	Arrival Time (min)	2.2	2.8	2.0	2.5	5.8	4.6
25	Peak Time (min)	6.2	5.7	3.8	4.9	13.7	8.9
26	Dough Stability (min)	10.5	7.2	6.1	5.2	14.1	8.3
27	MTI (bu)	25.0	40.0	36.0	50.0	12.0	39.0
28	TTB (min)	12.0	9.6	8.1	7.7	20.0	13.1
			0.0			_0.0	
	II. Cooperator Results						
29	Bake Absorption (Ave %)	64.9	65.3	66.6	66.4	65.8	65.5
30	Loaf Volume (% of Check)		95.6		93.5		90.8

Trait	ND810 II. Cooperator Results	C9 Glenn	C7	K9 Glenn	K7	W9 Glenn	W7
31	Mixing Requirement	4.0	2.9	3.4	2.1	4.1	3.4
	5 Very Long						
	4 Long						
	3 Medium						
	2 Short						
	1 Very Short						
32	Dough Characteristics	3.8	3.2	4.0	2.7	3.9	3.8
	5 Bucky-Tough						
	4 Strong-Elastic						
	3 Medium-Pliable						
	2 Mellow-Very Pliable						
	1 Weak-Short or Sticky				~ ~		
33	Mixing Tolerance		2.3		2.4		2.2
	5 Much More Tolerance Than Check						
	4 More Tolerance Than Check						
	3 Tolerance Equivalent To Check 2 Less Tolerance Than Check						
	1 Much Less Tolerance Than Check						
34	Internal Crumb Color		3.3		3.0		3.5
34	5 Much Brighter Than Check		5.5		3.0		3.5
	4 Brighter Than Check						
	3 Equivalent To Check						
	2 Poorer Than Check						
	1 Much Poorer Than Check						
35	Internal Grain and Texture		3.5		3.1		3.1
	5 Much Better Than Check		0.0		•		•
	4 Better Than Check						
	3 Equivalent To Check						
	2 Poorer Than Check						
	1 Much Poorer Than Check						
	III. Cooperator Evaluation						
	Quality Trait 1-2: Protein		2.8		2.7		2.2
	5 Much Better Than Check						
	4 Better Than Check						
	3 Equivalent To Check						
	2 Poorer Than Check						
	1 Much Poorer Than Check						
	Quality Trait 3-21: Milling		2.9		2.8		2.3
	5 Much Better Than Check						
	4 Better Than Check						
	3 Equivalent To Check						
	2 Poorer Than Check 1 Much Poorer Than Check						
			20		2.2		
	Quality Trait 22-35: Baking <u>5</u> Much Better Than Check		2.8		2.3		2.2
	4 Better Than Check						
	3 Equivalent To Check						
	2 Poorer Than Check						
	1 Much Poorer Than Check						
	Quality Trait 1-35: Overall Comparison		2.7		2.6		2.5
	5 Much Better Than Check						
	4 Better Than Check						
	3 Equivalent To Check						
	2 Poorer Than Check						
	1 Much Poorer Than Check						

CA905-780

	CA905-780	B9	B8
Trait	I. USDA/ARS WQL Data	Glenn	
1	Wheat Protein (12%mb)	15.5	15.1
2	Flour Protein (12%mb)	15.2	14.5
-			
3	Market Value (Score 1-6)	4.8	4.2
4	Market Value (Score 1-10)	10	8.8
5	Test Weight (Ib/bu)	63.3	60.2
6	1000 Kernel Weight (g)	35.6	33.9
7	Kernel Size % Large	79	69
8	Kernel Size % Small	3	5
9	Wheat Moisture (%)	10.8	10.5
10	Wheat Ash (14%mb)	1.57	1.60
11	Wheat Falling Number (sec)	400	423
12	SKCS Hardness Index	83.7	67.9
13	Vitreous Kernels (%)	92.0	57.6
	Flour Extraction (%)		
14	Tempered Wheat Basis (%)	69.9	72.7
15	Total Product Basis (%)	73.7	75.6
16	Flour /Bu Wheat (lbs)	46.2	45.8
17	Flour Color Brightness (L*)	89.8	89.9
18	Flour Color Yellowness (b*)	8.2	8.7
19	Flour Moisture (%)	13.3	13.3
20	Flour Ash (14%mb)	0.518	0.579
21	Flour FN (Malted) (sec)	251	252
	Farinograph		
22	Water Absorption (500bu)	68.8	64.7
23	Water Absorption (14%mb)	68.0	63.9
24	Arrival Time (min)	3.9	3.6
25	Peak Time (min)	8.0	4.7
26	Dough Stability (min)	10.1	4.8
27	MTI (bu)	26.0	37.0
28	TTB (min)	13.6	8.9
	II. Cooperator Results		
29	Bake Absorption (Ave %)	66.7	63.4
29 30	Loaf Volume (% of Check)	00.7	94.5
30			94.5

	CA905-780	B9	B8
	II. Cooperator Results	Glenn	
31	Mixing Requirement	3.7	1.6
	5 Very Long		
	4 Long		
	3 Medium		
	2 Short		
22	1 Very Short	4.0	4 7
32	Dough Characteristics 5 Bucky-Tough	4.0	1.7
	4 Strong-Elastic		
	3 Medium-Pliable		
	2 Mellow-Very Pliable		
	1 Weak-Short or Sticky		
33	Mixing Tolerance		1.7
	5 Much More Tolerance Than Check		
	4 More Tolerance Than Check		
	3 Tolerance Equivalent To Check		
	2 Less Tolerance Than Check		
	1 Much Less Tolerance Than Check		
34	Internal Crumb Color		2.5
	5 Much Brighter Than Check		
	4 Brighter Than Check		
	3 Equivalent To Check		
	2 Poorer Than Check		
	1 Much Poorer Than Check		
35	Internal Grain and Texture		2.7
	5 Much Better Than Check		
	4 Better Than Check		
	3 Equivalent To Check		
	2 Poorer Than Check		
	1 Much Poorer Than Check		
	III. Cooperator Evaluation		
	Quality Trait 1-2: Protein		2.3
	5 Much Better Than Check		
	4 Better Than Check		
	3 Equivalent To Check 2 Poorer Than Check		
	2 Poorer Than Check 1 Much Poorer Than Check		
	Quality Trait 3-21: Milling		2.7
	5 Much Better Than Check		2.1
	4 Better Than Check		
	3 Equivalent To Check		
	2 Poorer Than Check		
	1 Much Poorer Than Check		
	Quality Trait 22-35: Baking		1.7
	5 Much Better Than Check		
	4 Better Than Check		
	3 Equivalent To Check		
	2 Poorer Than Check		
	1 Much Poorer Than Check		
	Quality Trait 1-35: Overall Comparison		2.1
	5 Much Better Than Check		
	4 Better Than Check		
	3 Equivalent To Check		
	2 Poorer Than Check		
	1 Much Poorer Than Check		

MN03196

Trait	MN03196 I. USDA/ARS WQL Data	B9 Glenn	B10	C9 Glenn	C10	K9 Glenn	K10	M9 Glenn	M10
1	Wheat Protein (12%mb)	15.5	14.8	14.5	14.3	14.1	13.8	14.8	14.3
2	Flour Protein (12%mb)	15.2	14.6	14.0	13.7	13.3	13.4	14.7	13.6
3	Market Value (Score 1-6)	4.8	4.6	4.2	4.1	3.7	4.1	4.4	4.3
4	Market Value (Score 1-10)	10	9.0	10	9.6	10	9.6	10	9.4
5	Test Weight (lb/bu)	63.3	62.6	63.6	62.1	64.5	64.0	62.8	62.3
6	1000 Kernel Weight (g)	35.6	33.1	28.3	28.8	33.4	30.8	32.5	33.3
7	Kernel Size % Large	79	71	47	53	71	57	68	67
8	Kernel Size % Small	3	7	9	10	4	9	5	7
9	Wheat Moisture (%)	10.8	10.2	10.2	9.6	9.7	9.6	10.1	10.4
10	Wheat Ash (14%mb)	1.57	1.54	1.54	1.57	1.47	1.38	1.19	1.24
11	Wheat Falling Number (sec)	400	445	418	461	312	406	388	410
12	SKCS Hardness Index	83.7	89.6	88.6	85.1	87.5	87.9	72.7	78.7
13	Vitreous Kernels (%)	92.0	82.7	90.2	82.8	91.2	82.6	71.0	67.2
	Flour Extraction (%)								
14	Tempered Wheat Basis (%)	69.9	70.0	69.4	70.6	68.8	70.6	72.9	71.8
15	Total Product Basis (%)	73.7	73.5	73.1	73.6	72.0	74.0	75.9	75.0
16	Flour /Bu Wheat (lbs)	46.2	45.9	46.6	46.9	47.2	47.9	48.5	47.3
17	Flour Color Brightness (L*)	89.8	89.7	89.9	89.6	90.2	90.0	90.0	89.8
18	Flour Color Yellowness (b*)	8.2	8.6	8.4	8.9	7.5	8.7	8.1	8.5
19	Flour Moisture (%)	13.3	13.2	12.5	13.2	13.2	13.0	13.4	13.0
20	Flour Ash (14%mb)	0.518	0.539	0.473	0.497	0.468	0.450	0.433	0.441
21	Flour FN (Malted) (sec)	251	258	252	255	259	267	252	267
	Farinograph								
22	Water Absorption (500bu)	68.8	69.8	66.1	64.0	68.6	66.4	66.1	67.6
23	Water Absorption (14%mb)	68.0	68.9	64.4	63.1	67.7	65.2	65.4	66.4
24	Arrival Time (min)	3.9	3.9	2.2	3.3	2.0	2.8	4.7	4.7
25	Peak Time (min)	8.0	7.0	6.2	7.2	3.8	7.7	9.7	7.5
26	Dough Stability (min)	10.1	7.3	10.5	9.0	6.1	10.6	11.5	7.4
27	MTI (bu)	26.0	37.0	25.0	31.0	36.0	25.0	25.0	33.0
28	TTB (min)	13.6	11.2	12.0	12.1	8.1	12.9	15.2	11.9
	II. Cooperator Results	~~ -	07.4		00 1		05.4	05.0	
29	Bake Absorption (Ave %)	66.7	67.1	64.9	63.4	66.6	65.1	65.2	65.7
30	Loaf Volume (% of Check)		97.6		96.3		95.7		95.7

MN03196

Trait	MN03196 II. Cooperator Results	B9 Glenn	B10	C9 Glenn	C10	K9 Glenn	K10	M9 Glenn	M10
31	Mixing Requirement	3.7	3.3	4.0	3.5	3.5	3.2	3.5	2.7
	5 Very Long								
	4 Long								
	3 Medium								
	2 Short								
	1 Very Short								
32	Dough Characteristics	4.0	3.1	3.8	3.7	4.0	3.2	4.0	3.3
	5 Bucky-Tough								
	4 Strong-Elastic								
	3 Medium-Pliable								
	2 Mellow-Very Pliable								
	1 Weak-Short or Sticky								
33	Mixing Tolerance		2.7		2.7		3.5		2.2
	5 Much More Tolerance Than Check								
	4 More Tolerance Than Check								
	3 Tolerance Equivalent To Check								
	2 Less Tolerance Than Check								
	1 Much Less Tolerance Than Check								
34	Internal Crumb Color		2.7		2.9		2.7		2.4
	5 Much Brighter Than Check								
	4 Brighter Than Check								
	3 Equivalent To Check								
	2 Poorer Than Check								
	1 Much Poorer Than Check								
35	Internal Grain and Texture		3.1		3.6		2.5		2.9
	5 Much Better Than Check								
	4 Better Than Check								
	3 Equivalent To Check								
	2 Poorer Than Check								
	1 Much Poorer Than Check								
	III. Cooperator Evaluation								
	Quality Trait 1-2: Protein		2.5		2.8		3.0		2.3
	5 Much Better Than Check								
	4 Better Than Check								
	3 Equivalent To Check								
	2 Poorer Than Check								
	1 Much Poorer Than Check								
	Quality Trait 3-21: Milling		2.8		3.0		3.5		2.7
	5 Much Better Than Check								
	4 Better Than Check								
	3 Equivalent To Check								
	2 Poorer Than Check								
	1 Much Poorer Than Check								
	Quality Trait 22-35: Baking		2.3		2.8		2.8		2.6
	5 Much Better Than Check								
	4 Better Than Check								
	3 Equivalent To Check								
	2 Poorer Than Check 1 Much Poorer Than Check								
			26		2.0		20		27
	Quality Trait 1-35: Overall Comparison		2.6		2.8		2.8		2.7
	5 Much Better Than Check								
	4 Better Than Check								
	3 Equivalent To Check 2 Poorer Than Check								
	2 Poorer Than Check 1 Much Poorer Than Check								

BZ903-504

Trait	BZ903-504 I. USDA/ARS WQL Data	M9 Glenn	M11
1	Wheat Protein (12%mb)	14.8	14.4
2	Flour Protein (12%mb)	14.7	13.5
3	Market Value (Score 1-6)	4.4	4.1
4	Market Value (Score 1-10)	10	8.8
5	Test Weight (Ib/bu)	62.8	60.4
6	1000 Kernel Weight (g)	32.5	37.9
7	Kernel Size % Large	68	81
8	Kernel Size % Small	5	3
9	Wheat Moisture (%)	10.1	10.4
10	Wheat Ash (14%mb)	1.19	1.19
11	Wheat Falling Number (sec)	388	391
12	SKCS Hardness Index	72.7	70.4
13	Vitreous Kernels (%)	71.0	53.6
	Flour Extraction (%)		
14	Tempered Wheat Basis (%)	72.9	71.5
15	Total Product Basis (%)	75.9	75.1
16	Flour /Bu Wheat (lbs)	48.5	45.8
17	Flour Color Brightness (L*)	90.0	89.9
18	Flour Color Yellowness (b*)	8.1	8.7
19	Flour Moisture (%)	13.4	13.0
20	Flour Ash (14%mb)	0.433	0.434
21	Flour FN (Malted) (sec)	252	266
	Farinograph		
22	Water Absorption (500bu)	66.1	66.0
23	Water Absorption (14%mb)	65.4	64.8
24	Arrival Time (min)	4.7	4.0

25	Peak Time (min)	9.7	7.2
26	Dough Stability (min)	11.5	7.7
27	MTI (bu)	25.0	34.0
28	TTB (min)	15.2	11.4

	II. Cooperator Results		
29	Bake Absorption (Ave %)	65.2	64.5
30	Loaf Volume (% of Check)		96.2

31 Mixing Requirement 3.5 2 31 S Very Long 4 Long 3 Medium 2 32 Dough Characteristics 4.0 3 32 Dough Characteristics 4.0 3 32 Dough Characteristics 4.0 3 32 Dough Characteristics 5 Bucky-Tough 4 Strong-Elastic 3 Medium-Pliable 4.0 33 Mixing Tolerance 5 Much More Tolerance Than Check 4 More Tolerance Than Check 4 33 Tolerance Equivalent To Check 2 Less Tolerance Than Check 1 4 34 Internal Crumb Color 3 3 55 Much Brighter Than Check 2 2 40 Tolerance Than Check 3 2 34 Internal Crumb Color 3 3 55 Much Poorer Than Check 3 Equivalent To Check 2 35 Internal Grain and Texture 3 5 Much Poorer Than Check 4 36 Internal Grain and Texture 3 5 Much Poorer Than Check 4 35 Internal Grain and Texture 3	31 Mixing Requirement 3.5 2.9 5 Very Long 4 4 Long 3 3 Medium 2 2 Dough Characteristics 4.0 3.2 3 Medium-Pilable 2 Short 3 Medium-Pilable 3 Medium-Pilable 2 Dough Characteristics 4.0 3.2 3 Mixing Tolerance Shuch More Tolerance Than Check 4 4 More Tolerance Than Check 3 1 3 Tolerance Equivalent To Check 3.0 3.0 5 Much Less Tolerance Than Check 3.0 3.0 5 Much Deorer Than Check 3 2 4 Brighter Than Check 3 3.0 5 Much Better Than Check 3 3.0 5 Much Poorer Than Check 3 3.1 5 Much Poorer Than Check 3 4 6 Much Poorer Than Check 3 4 1 Much Poorer Than Check 3 4		BZ903-504	M9	M11
5 Very Long 4 Long 3 Medium 2 Short 1 Very Short 32 22 Dough Characteristics 4 5 Bucky-Tough 4 2 Medium-Pliable 2 3 Mixing Tolerance 5 5 Much More Tolerance Than Check 4 4 More Tolerance Than Check 2 1 Wuch Less Tolerance Than Check 2 1 1 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 <t< td=""><td>5 Very Long 4 Long 3 Medium 2 Short 1 Very Short 22 Dough Characteristics 5 Bucky-Tough 4 Strong-Elastic 3 Medium-Pilable 2 Mellow-Very Pilable 1 Weak-Short or Sticky 21 Mixing Tolerance 21 Mixing Tolerance 21 Much More Tolerance Than Check 4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Poorer Than Check 3 Much Brighter Than Check 3 Much Brighter Than Check 3 Much Better Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check</td><td>Trait</td><td></td><td>Glenn</td><td></td></t<>	5 Very Long 4 Long 3 Medium 2 Short 1 Very Short 22 Dough Characteristics 5 Bucky-Tough 4 Strong-Elastic 3 Medium-Pilable 2 Mellow-Very Pilable 1 Weak-Short or Sticky 21 Mixing Tolerance 21 Mixing Tolerance 21 Much More Tolerance Than Check 4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Poorer Than Check 3 Much Brighter Than Check 3 Much Brighter Than Check 3 Much Better Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check	Trait		Glenn	
4 Long 3 Medium 2 Short 1 Very Short 32 Dough Characteristics 4 Strong-Elastic 3 Modium-Pliable 2 Mellow-Very Pliable 1 Weak-Short or Sticky 33 Mixing Tolerance 5 Much More Tolerance Than Check 4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 1 Much Less Tolerance Than Check 2 Poorer Than Check 4 Brighter Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equiv	4 Long 3 Medium 2 Short 1 Very Short 3 Medium-Piable 2 Dough Characteristics 5 Bucky-Tough 4 Strong-Elastic 3 Medium-Pilable 2 Wellow-Very Pilable 1 Weak-Short or Sticky 1 Weak-Short or Sticky 2 Less Tolerance Than Check 4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 2 Less Tolerance Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Brighter Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 2 Poorer Than Check 3 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check	31		3.5	2.9
3 Medium 2 Short 1 Very Short 32 Dough Characteristics 5 Bucky-Tough 4 Strong-Elastic 3 Medium-Pliable 2 Mellow-Very Pliable 1 Weak-Short or Sticky 33 Mixing Tolerance 5 Much More Tolerance Than Check 4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 1 Much Color 5 Much Brighter Than Check 4 Brighter Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equ	3 Medium 2 Short 1 Very Short 1 Very Short 3 Dough Characteristics 5 Bucky-Tough 4 Strong-Elastic 3 Medium-Pliable 2 Mellow-Very Pliable 1 Weak-Short or Sticky 2 Muxing Tolerance 1 Much More Tolerance Than Check 4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 4 Much Less Tolerance Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Bequivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Po		5 Very Long		
2 Short 1 Very Short 32 Dough Characteristics 5 Bucky-Tough 4 Strong-Elastic 3 Medium-Pliable 2 Mellow-Very Pliable 1 Weak-Short or Sticky 33 Mixing Tolerance 2 34 Mixing Tolerance 1 Weak-Short or Sticky 35 Much More Tolerance Than Check 4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 35 Internal Crumb Color 5 Much Brighter Than Check 36 Less Tolerance Than Check 4 Brighter Than Check 36 Internal Grain and Texture 3 35 Internal Grain and Texture 3 36 Internal Grain and Texture 3 37 Oporer Than Check 4 Better Than Check 39 Internal Grain and Texture 3 30 Much Poorer Than Check 2 Poorer Than Check 310 Internal Grain and Texture 3 32 Internal Grain and Texture 3 33 Much Better Than Check 4 Better Than Check 310 Internal Grain and Texture 3 32 Aporer Than Check 2 Poorer Than Check 33 Much Better Than Check 4 Better Than Check 34 Duch Poorer Than Check 2 P	2 Short 1 Very Short 32 Dough Characteristics 5 Bucky-Tough 4 Strong-Elastic 3 Medium-Pilable 2 Mellow-Very Pilable 2 Mellow-Very Pilable 1 Weak-Short or Sticky 2.1 3 Mixing Tolerance 2.1 5 Much More Tolerance Than Check 4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 3.0 5 Much Brighter Than Check 4 Brighter Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 3.1 5 Much Better Than Check 4 Better Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check		-		
1 Very Short 4.0 32 Dough Characteristics 5 Bucky-Tough 4 Strong-Elastic 3 Medium-Pliable 2 Mellow-Very Pliable 1 Weak-Short or Sticky 33 Mixing Tolerance 1 Weak-Short or Sticky 33 Mixing Tolerance 5 Much More Tolerance Than Check 4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Poorer Than Check 3 Huch Boorer Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check	1 Very Short32 Dough Characteristics5 Bucky-Tough 4 Strong-Elastic3 Medium-Pliable 2 Mellow-Very Pliable 1 Weak-Short or Sticky33 Mixing Tolerance1 Weak-Short or Sticky33 Mixing Tolerance2 Less Tolerance Than Check 4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 4 Brighter Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Brighter Than Check 2 Poorer Than Check 4 Brighter Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 4 Better Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 4 Better Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 4 Better Than Check 4 Better Than Check 		3 Medium		
 32 Dough Characteristics 5 Bucky-Tough 4 Strong-Elastic 3 Medium-Pilable 2 Mellow-Very Pilable 1 Weak-Short or Sticky 33 Mixing Tolerance 5 Much More Tolerance Than Check 4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 1 Much Less Tolerance Than Check 4 Brighter Than Check 2 Equivalent To Check 2 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 3 Equivalent To Check 4 Better Than Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 4 Better Than Check 4 Duch Poorer Than Check 4 Better Than Check 4 Duch Poorer Than Check 5 Much Better Than Check 4 B	32 Dough Characteristics 4.0 3.2 5 Bucky-Tough 4 Strong-Elastic 3 Medium-Pliable 1 Weak-Short or Sticky 3.2 33 Mixing Tolerance 1 Weak-Short or Sticky 33 Mixing Tolerance 2.1 5 Much More Tolerance Than Check 4 More Tolerance Than Check 2.1 5 Much More Tolerance Than Check 2 Less Tolerance Than Check 3.0 34 Internal Crumb Color 3.0 5 Much Brighter Than Check 4 Brighter Than Check 3.1 2 Poorer Than Check 2 Poorer Than Check 3.1 5 Much Poorer Than Check 4 Better Than Check 3.1 5 Internal Grain and Texture 5 Much Better Than Check 2 Poorer Than Check 3.1 6 Internal Grain and Texture 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check		2 Short		
5 Bucky-Tough 4 Strong-Elastic 3 Medium-Pilable 2 Mellow-Very Pilable 1 Weak-Short or Sticky 3 Mixing Tolerance 5 Much More Tolerance Than Check 4 More Tolerance Than Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 4 Brighter Than Check 2 Less Tolerance Than Check 3 Internal Crumb Color 5 Much Brighter Than Check 4 Brighter Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Internal Grain and Texture 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 2 Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Detrer Than Check 4	5 Bucky-Tough 4 Strong-Elastic 3 Medium-Pliable 2 Mellow-Very Pliable 1 Weak-Short or Sticky 3 Mixing Tolerance 2.1 5 Much More Tolerance Than Check 4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 1 Much Less Tolerance Than Check 2 Less Tolerance Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equiva		1 Very Short		
5 Bucky-Tough 4 Strong-Elastic 3 Medium-Pilable 2 Mellow-Very Pilable 1 Weak-Short or Sticky 3 Mixing Tolerance 5 Much More Tolerance Than Check 4 More Tolerance Than Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 4 Brighter Than Check 2 Less Tolerance Than Check 3 Internal Crumb Color 5 Much Brighter Than Check 4 Brighter Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Internal Grain and Texture 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 2 Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Detrer Than Check 4	5 Bucky-Tough 4 Strong-Elastic 3 Medium-Pliable 2 Mellow-Very Pliable 1 Weak-Short or Sticky 3 Mixing Tolerance 2.1 5 Much More Tolerance Than Check 4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 1 Much Less Tolerance Than Check 2 Less Tolerance Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equiva	32	Dough Characteristics	4.0	3.2
4 Strong-Elastic 3 Medium-Pliable 2 Mellow-Very Pliable 1 Weak-Short or Sticky 3 Mixing Tolerance 5 Much More Tolerance Than Check 4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 4 Internal Crumb Color 5 Much Brighter Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 4 Detrer Than Check 4 Detr	4 Strong-Elastic 3 Medium-Pliable 2 Mellow-Very Pliable 1 Weak-Short or Sticky 3 Mixing Tolerance 2.1 5 Much More Tolerance Than Check 4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 3 Tolerance Store Than Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check				
3 Medium-Pliable 2 Mellow-Very Pliable 1 Weak-Short or Sticky 33 Mixing Tolerance 5 Much More Tolerance Than Check 4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 4 Brighter Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 3 Equivalent To Check 3 Equivalent To Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 3 Equivalent To Check 4 Deorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Deorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Ch	3 Medium-Pliable 2 Mellow-Very Pliable 1 Weak-Short or Sticky 3 Mixing Tolerance 5 Much More Tolerance Than Check 4 More Tolerance Than Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 4 Internal Crumb Color 5 Much Brighter Than Check 4 Brighter Than Check 2 Poorer Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 3 Equivalent				
1 Weak-Short or Sticky 33 Mixing Tolerance 5 Much More Tolerance Than Check 4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 2 Less Tolerance Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check	1 Weak-Short or Sticky33 Mixing Tolerance2.15 Much More Tolerance Than Check4 More Tolerance Than Check3 Tolerance Equivalent To Check2 Less Tolerance Than Check1 Much Less Tolerance Than Check3 Much Brighter Than Check34 Internal Crumb Color3.05 Much Brighter Than Check4 Brighter Than Check3 Equivalent To Check2 Poorer Than Check2 Poorer Than Check1 Much Poorer Than Check35 Internal Grain and Texture3.15 Much Better Than Check3 Equivalent To Check2 Poorer Than Check1 Much Poorer Than Check3 Equivalent To Check2 Poorer Than Check1 Much Poorer Than Check1 Much Poorer Than Check1 Much Poorer Than Check2 Poorer Than Check1 Much Poorer Than Check2 Much Better Than Check2 Poorer Than Check2 Much Poorer Than Check3 Equivalent To Check2 Poorer Than Check2 Poorer Than Check3 Equivalent To Check2 Poorer Than Check2 Poorer Than Check3 Equivalent To Check2 Poorer Than Check3 Equivalent To Check2 Poorer Than Check3 Equivalent To Check3 Sinuch Better Than Check3 Equivalent To Check4 Better Than Check3 Equivalent To Check2 Poorer Than Check3 Equivalent To Check3 Equivalent To Check3 Equivalent To Check4 Better Than Check3 Equivalent To Check </td <td></td> <td>•</td> <td></td> <td></td>		•		
1 Weak-Short or Sticky 33 Mixing Tolerance 5 Much More Tolerance Than Check 4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 2 Less Tolerance Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check	1 Weak-Short or Sticky33 Mixing Tolerance2.15 Much More Tolerance Than Check4 More Tolerance Than Check3 Tolerance Equivalent To Check2 Less Tolerance Than Check1 Much Less Tolerance Than Check3 Much Brighter Than Check34 Internal Crumb Color3.05 Much Brighter Than Check4 Brighter Than Check3 Equivalent To Check2 Poorer Than Check2 Poorer Than Check1 Much Poorer Than Check35 Internal Grain and Texture3.15 Much Better Than Check3 Equivalent To Check2 Poorer Than Check1 Much Poorer Than Check3 Equivalent To Check2 Poorer Than Check1 Much Poorer Than Check1 Much Poorer Than Check1 Much Poorer Than Check2 Poorer Than Check1 Much Poorer Than Check2 Much Better Than Check2 Poorer Than Check2 Much Poorer Than Check3 Equivalent To Check2 Poorer Than Check2 Poorer Than Check3 Equivalent To Check2 Poorer Than Check2 Poorer Than Check3 Equivalent To Check2 Poorer Than Check3 Equivalent To Check2 Poorer Than Check3 Equivalent To Check3 Sinuch Better Than Check3 Equivalent To Check4 Better Than Check3 Equivalent To Check2 Poorer Than Check3 Equivalent To Check3 Equivalent To Check3 Equivalent To Check4 Better Than Check3 Equivalent To Check </td <td></td> <td>2 Mellow-Verv Pliable</td> <td></td> <td></td>		2 Mellow-Verv Pliable		
 33 Mixing Tolerance 5 Much More Tolerance Than Check 4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 34 Internal Crumb Color 35 Much Brighter Than Check 4 Brighter Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 4 Better Than Check 4 Better Than Check 4 Duch Poorer Than Check 4 Duch Poorer Than Check 4 Duch Poorer Than Check 5 Much Better Than Check 4 Duch	 Mixing Tolerance 5 Much More Tolerance Than Check 4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 2 Less Tolerance Than Check 4 Brighter Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 3 Equivalent To Check 3 Equivalent To Check 3 Equivalent To Check 3 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 3 Equivalent To Check 3 Equivalent To Check<td></td><td>-</td><td></td><td></td>		-		
5 Much More Tolerance Than Check 4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 34 Internal Crumb Color 5 Much Brighter Than Check 4 Brighter Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 35 Internal Grain and Texture 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Deter Than Check	5 Much More Tolerance Than Check 4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 1 Much Less Tolerance Than Check 1 Much Less Tolerance Than Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check	33	-		2.1
4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 34 Internal Crumb Color 5 Much Brighter Than Check 4 Brighter Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 35 Internal Grain and Texture 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 1 Much Poorer Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 4 Decer Than Check 5 Much Poorer Than Check 4 Decer Than Check 5 Much Poorer Than	4 More Tolerance Than Check 3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 3 Internal Crumb Color 5 Much Brighter Than Check 4 Brighter Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 3 Equiva		-		
3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 34 Internal Crumb Color 5 Much Brighter Than Check 4 Brighter Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 35 Internal Grain and Texture 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 1 Much Poorer Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Che	3 Tolerance Equivalent To Check 2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 34 Internal Crumb Color 5 Much Brighter Than Check 4 Brighter Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Ch				
2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 34 Internal Crumb Color 5 Much Brighter Than Check 4 Brighter Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 35 Internal Grain and Texture 36 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check <td>2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 34 Internal Crumb Color 3.0 5 Much Brighter Than Check 4 Brighter Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 35 Internal Grain and Texture 3.1 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 3 Equivalent To Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check <tr< td=""><td></td><td></td><td></td><td></td></tr<></td>	2 Less Tolerance Than Check 1 Much Less Tolerance Than Check 34 Internal Crumb Color 3.0 5 Much Brighter Than Check 4 Brighter Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 35 Internal Grain and Texture 3.1 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 3 Equivalent To Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check <tr< td=""><td></td><td></td><td></td><td></td></tr<>				
1 Much Less Tolerance Than Check 34 Internal Crumb Color 5 Much Brighter Than Check 4 Brighter Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 1 Much Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 5 Much Poorer Than Check 4 Better Tha	1 Much Less Tolerance Than Check 34 Internal Crumb Color 5. Much Brighter Than Check 34 Internal Crumb Color 5. Much Brighter Than Check 35 Internal Grain and Texture 3.1 35 Internal Grain and Texture 3.1 36 Internal Grain and Texture 3.1 37 Much Better Than Check 4 Better Than Check 38 Equivalent To Check 2 Poorer Than Check 39 Internal Grain and Texture 3.1 5 Much Better Than Check 4 Better Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Quality Trait 3-21: Milling 2.9 5 Much Better Than Check 2 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check		-		
 34 Internal Crumb Color 5 Much Brighter Than Check 4 Brighter Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 35 Internal Grain and Texture 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 4 Better Than Check 5 Much Better Than Check 4 Duch Poorer Than Check 4 Duch Poorer Than Check 4 Detter Than Check 5 Much Better Than Check 4 Detter Than Check 4 Detter Than Check 5 Much Poorer Than Check 6 Much Poorer Than Check 7 Dorer Than Check 9 Dorer Than Check 1 Much Poorer Than Check 2 Poorer	 34 Internal Crumb Color 5 Much Brighter Than Check 4 Brighter Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Internal Grain and Texture 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Equivalent To Check 2 Poorer Than Check 2 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 3 Equivalent To Check 3 Equivalent To Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 4 Better Than Check 4 Better Than Check 5 Much Better Than Check 4 Better Than Check 4 Better Than Check 5 Much Better Than Check 4 Better Than Check 4 Better Than Check 5 Much Better Than Check 4 Better Than Check 5 Much Better Than Check 5 Much Better Than Check 6 Much Poorer Than Check 7 Muc				
5 Much Brighter Than Check 4 Brighter Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 35 Internal Grain and Texture 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check III. Cooperator Evaluation Quality Trait 1-2: Protein 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 3 Equivalent To Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 5 Much Poorer Than Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 5 Much Poorer Than	5 Much Brighter Than Check 4 Brighter Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 3 Internal Grain and Texture 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check	31			3.0
4 Brighter Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 35 Internal Grain and Texture 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check III. Cooperator Evaluation Quality Trait 1-2: Protein 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Dorer Than Check 4 Better Than Check 4 Dorer Than Check 4 Detter Than Check 4 Better Than Check 5 Much Poorer Than	4 Brighter Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 3 Internal Grain and Texture 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 3 Equivalent To Check 4 Better Than Check 3 Equivalent To Check 3 Equivalent To Check 4 Better Than Check 4 Be	34			5.0
3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 35 Internal Grain and Texture 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check II. Cooperator Evaluation Quality Trait 1-2: Protein 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 5 Much Poorer Than Check 4 Better Than Check 5 Much Poorer Than Check 5	3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 3 Internal Grain and Texture 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 3 Equivalent To Check 4 Better Than Check 4 Bette				
2 Poorer Than Check 1 Much Poorer Than Check 35 Internal Grain and Texture 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 5 Much Poorer Than Check 4 Detter Than Check 4 Better Tha	2 Poorer Than Check 1 Much Poorer Than Check 35 Internal Grain and Texture 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 1 Much Poorer Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 3 Equivalent To Check 4 Better Than Check 3 Equivalent To Check 3 Equivalent To Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 3 Equivalent To Check		-		
1 Much Poorer Than Check 35 Internal Grain and Texture 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check III. Cooperator Evaluation Quality Trait 1-2: Protein 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 4 Better Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 5 Much Poorer Than Check 4 Better Than Check 5 Much Poorer Than Check 4 Detter Than Check 5 Much Poorer Than Check 4 Detter Than Check 5 Much Poorer Than Check	1 Much Poorer Than Check 35 Internal Grain and Texture 3.1 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check		•		
35 Internal Grain and Texture 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check III. Cooperator Evaluation Quality Trait 1-2: Protein 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Ch	 35 Internal Grain and Texture 3.1 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 4 Better Than Check 4 Better Than Check 4 Better Than Check 5 Much Better Than Check 4 Better Than Check 5 Much Better Than Check 4 Better Than Check 5 Much Better Than Check 5 Much Better Than Check 4 Better Than Check 5 Much Better Than Check 4 Better Than Check 5 Much Better Than Check 6 Much Better Than Check 7 Buch Better Than Check 8 Equivalent To Check 				
5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check III. Cooperator Evaluation Quality Trait 1-2: Protein 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 4 Etter Than Check 3 Equivalent To Check 3	5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Better Than Check 4 Better Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check	05			
4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check III. Cooperator Evaluation Quality Trait 1-2: Protein 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 3 Equiva	4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check III. Cooperator Evaluation Quality Trait 1-2: Protein 2.3 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check	35			3.1
3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check III. Cooperator Evaluation Quality Trait 1-2: Protein 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 3 Equ	3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check III. Cooperator Evaluation Quality Trait 1-2: Protein 2.3 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 3 Equivalent To Check				
2 Poorer Than Check 1 Much Poorer Than Check III. Cooperator Evaluation Quality Trait 1-2: Protein 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 3-21: Milling 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To C	2 Poorer Than Check1 Much Poorer Than CheckIII. Cooperator EvaluationQuality Trait 1-2: Protein2.35 Much Better Than Check4 Better Than Check3 Equivalent To Check2 Poorer Than Check1 Much Poorer Than CheckQuality Trait 3-21: Milling2.95 Much Better Than Check4 Better Than Check2 Poorer Than Check4 Better Than Check2 Poorer Than Check3 Equivalent To Check4 Better Than Check4 Better Than Check2 Poorer Than Check3 Equivalent To Check2 Poorer Than Check3 Equivalent To Check2 Poorer Than Check3 Equivalent To Check2 Poorer Than Check4 Better Than Check1 Much Poorer Than Check2 Poorer Than Check3 Equivalent To Check2 Poorer Than Check3 Equivalent To Check4 Better Than Check4 Better Than Check4 Better Than Check5 Much Better Than Check4 Better Than Check5 Much Better Than Check4 Better Than Check5 Much Better Than Check5 Much Better Than Check6 Much Better Than Check5 Much Better Than Check6 Sequivalent To Check7 Sequivalent To Check8 Sequivalent To Check9				
1 Much Poorer Than Check III. Cooperator Evaluation Quality Trait 1-2: Protein 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 3-21: Milling 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 3 Equivale	1 Much Poorer Than CheckIII. Cooperator EvaluationQuality Trait 1-2: Protein2.35 Much Better Than Check4 Better Than Check3 Equivalent To Check2 Poorer Than Check1 Much Poorer Than Check1 Much Poorer Than Check2 Quality Trait 3-21: Milling5 Much Better Than Check4 Better Than Check4 Better Than Check2 Poorer Than Check3 Equivalent To Check2 Poorer Than Check1 Much Poorer Than Check2 Poorer Than Check2 Poorer Than Check3 Equivalent To Check2 Poorer Than Check3 Equivalent To Check2 Poorer Than Check3 Equivalent To Check3 Equivalent To Check4 Better Than Check4 Better Than Check4 Better Than Check5 Much Better Than Check4 Better Than Check3 Equivalent To Check3 Equivalent To Check4 Better Than Check3 Equivalent To Check5 Much Better Than Check4 Better Than Check5 Much Better Than Check6 Sequivalent To Check7 Sequivalent To Check8 Sequivalent To Check9 Sequivalent To Check <td></td> <td>-</td> <td></td> <td></td>		-		
III. Cooperator Evaluation Quality Trait 1-2: Protein25 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 3-21: Milling25 Much Better Than Check 4 Better Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 4 Deorer Than Check <td>III. Cooperator Evaluation Quality Trait 1-2: Protein2.3S Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 4 Better Than Check 4 Better Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 3 Equivalent To Check 4 Better Than Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check</br></td> <td></td> <td></td> <td></td> <td></td>	III. Cooperator Evaluation Quality Trait 1-2: Protein2.3S Much Better Than Check 				
Quality Trait 1-2: Protein25 Much Better Than Check4 Better Than Check3 Equivalent To Check2 Poorer Than Check2 Poorer Than Check1 Much Poorer Than CheckQuality Trait 3-21: Milling25 Much Better Than Check4 Better Than Check4 Better Than Check2 Poorer Than Check3 Equivalent To Check2 Poorer Than Check4 Better Than Check2 Poorer Than Check1 Much Poorer Than Check2 Poorer Than Check2 Quality Trait 22-35: Baking25 Much Better Than Check3 Equivalent To Check3 Equivalent To Check2 Poorer Than Check1 Much Poorer Than Check1 Much Poorer Than Check2 Poorer Than Check1 Much Poorer Than Check1 Much Poorer Than Check2 Poorer Than Check2 Poorer Than Check1 Much Poorer Than Check2 Quality Trait 1-35: Overall Comparison2	Quality Trait 1-2: Protein2.35 Much Better Than Check4 Better Than Check3 Equivalent To Check2 Poorer Than Check1 Much Poorer Than CheckQuality Trait 3-21: Milling5 Much Better Than Check4 Better Than Check3 Equivalent To Check2 Poorer Than Check4 Better Than Check3 Equivalent To Check2 Poorer Than Check1 Much Poorer Than Check2 Poorer Than Check2 Poorer Than Check1 Much Poorer Than Check2 Poorer Than Check2 Poorer Than Check3 Equivalent To Check2 Poorer Than Check3 Equivalent To Check2 Poorer Than Check1 Much Poorer Than Check2 Poorer Than Check1 Much Poorer Than Check2 Poorer Than Check2 Poorer Than Check3 Equivalent To Check2 Poorer Than Check3 Equivalent To Check2 Poult Trait 1-35: Overall Comparison5 Much Better Than Check4 Better Than Check3 Equivalent To Check3 Equivalent To Check3 Equivalent To Check				
5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 3-21: Milling 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 22-35: Baking 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check	5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 3-21: Milling 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 22-35: Baking 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check				
4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 3-21: Milling 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 22-35: Baking 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Chec	4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 3-21: Milling 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check		-		2.3
3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 3-21: Milling 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 22-35: Baking 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check	3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 3-21: Milling 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 22-35: Baking 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 3 Equivalent To Check				
2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 3-21: Milling 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 22-35: Baking 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check	2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 3-21: Milling 2.9 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 22-35: Baking 2.6 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 2 Poorer Than Check 3 Equivalent To Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check				
1 Much Poorer Than Check Quality Trait 3-21: Milling 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 22-35: Baking 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 1 Much Poorer Than Check 2 Quality Trait 1-35: Overall Comparison	1 Much Poorer Than Check Quality Trait 3-21: Milling 2.9 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 22-35: Baking 2.6 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 3 Equivalent To Check 2 Poorer Than Check 4 Better Than Check 3 Equivalent To Check 2 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 4 Better Than Check 3 Equivalent To Check		•		
Quality Trait 3-21: Milling 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 22-35: Baking 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check 2 Quality Trait 1-35: Overall Comparison 2	Quality Trait 3-21: Milling2.95 Much Better Than Check4 Better Than Check3 Equivalent To Check2 Poorer Than Check1 Much Poorer Than CheckQuality Trait 22-35: Baking5 Much Better Than Check4 Better Than Check4 Better Than Check2 Poorer Than Check2 Poorer Than Check1 Much Poorer Than Check2 Poorer Than Check2 Poorer Than Check1 Much Poorer Than CheckQuality Trait 1-35: Overall Comparison5 Much Better Than Check4 Better Than Check4 Better Than Check3 Equivalent To Check3 Equivalent To Check3 Equivalent To Check				
5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 22-35: Baking 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 1-35: Overall Comparison	5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 22-35: Baking 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 1-35: Overall Comparison 5 Much Better Than Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check 3 Equivalent To Check				
4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 22-35: Baking 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 1-35: Overall Comparison	4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 22-35: Baking 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 1-35: Overall Comparison 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 3 Equivalent To Check				2.9
3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 22-35: Baking 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 1-35: Overall Comparison	3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 22-35: Baking 5 Much Better Than Check 4 Better Than Check 2 Poorer Than Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 1-35: Overall Comparison 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check				
2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 22-35: Baking 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 1-35: Overall Comparison	2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 22-35: Baking 2.6 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 1-35: Overall Comparison 2.6 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check				
1 Much Poorer Than Check Quality Trait 22-35: Baking 2 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 1-35: Overall Comparison 2	1 Much Poorer Than CheckQuality Trait 22-35: Baking2.65 Much Better Than Check4 Better Than Check3 Equivalent To Check2 Poorer Than Check1 Much Poorer Than Check1 Much Poorer Than CheckQuality Trait 1-35: Overall Comparison2.65 Much Better Than Check4 Better Than Check4 Better Than Check2 Poorer Than Check5 Much Better Than Check2.65 Much Better Than Check3 Equivalent To Check		•		
Quality Trait 22-35: Baking 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 1-35: Overall Comparison	Quality Trait 22-35: Baking2.65 Much Better Than Check4 Better Than Check4 Better Than Check3 Equivalent To Check2 Poorer Than Check2 Poorer Than Check1 Much Poorer Than Check1 Much Poorer Than CheckQuality Trait 1-35: Overall Comparison2.65 Much Better Than Check4 Better Than Check4 Better Than Check3 Equivalent To Check		2 Poorer Than Check		
5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 1-35: Overall Comparison	5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 1-35: Overall Comparison 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check		1 Much Poorer Than Check		
4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 1-35: Overall Comparison	4 Better Than Check 3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 1-35: Overall Comparison 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check		Quality Trait 22-35: Baking		2.6
3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 1-35: Overall Comparison	3 Equivalent To Check 2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 1-35: Overall Comparison 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check		5 Much Better Than Check		
2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 1-35: Overall Comparison	2 Poorer Than Check 1 Much Poorer Than Check Quality Trait 1-35: Overall Comparison 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check		4 Better Than Check		
1 Much Poorer Than Check Quality Trait 1-35: Overall Comparison	1 Much Poorer Than Check Quality Trait 1-35: Overall Comparison 2.6 5 Much Better Than Check 4 Better Than Check 4 Better Than Check 3 Equivalent To Check		3 Equivalent To Check		
Quality Trait 1-35: Overall Comparison	Quality Trait 1-35: Overall Comparison 2.6 5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check 3 Equivalent To Check		2 Poorer Than Check		
	5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check		1 Much Poorer Than Check		
	5 Much Better Than Check 4 Better Than Check 3 Equivalent To Check		Quality Trait 1-35: Overall Comparison		2.6
5 Much Better Than Check	4 Better Than Check 3 Equivalent To Check				
4 Better Than Check	3 Equivalent To Check		4 Better Than Check		
			2 Poorer Than Check		
	1 Much Poorer Than Check				

Trait	ND808 I. USDA/ARS WQL Data	C9 Glenn	C12	K9 Glenn	K12	M9 Glenn	M12	W9 Glenn	W12
1 1	Wheat Protein (12%mb)	14.5	14.3	14.1	12.2	14.8	13.9	16.2	15.3
2	Flour Protein (12%mb)	14.0	13.8	13.3	11.7	14.7	13.1	16.2	14.7
-		14.0	10.0	10.0		14.1	10.1	10.2	14.7
3	Market Value (Score 1-6)	4.2	4.0	3.7	3.9	4.4	4.0	4.8	4.0
4	Market Value (Score 1-10)	10	8.8	10	7.4	10	8.2	10	8.2
5	Test Weight (lb/bu)	63.6	60.6	64.5	63.0	62.8	60.6	62.4	58.7
6	1000 Kernel Weight (g)	28.3	33.4	33.4	37.7	32.5	39.2	28.4	30.3
7	Kernel Size % Large	47	70	71	87	68	83	27	47
8	Kernel Size % Small	9	6	4	3	5	3	11	9
9	Wheat Moisture (%)	10.2	9.6	9.7	9.7	10.1	9.9	9.4	9.5
10	Wheat Ash (14%mb)	1.54	1.51	1.47	1.31	1.19	1.18	1.44	1.35
11	Wheat Falling Number (sec)	418	460	312	336	388	373	464	466
12	SKCS Hardness Index	88.6	79.7	87.5	76.0	72.7	67.5	76.6	73.7
13	Vitreous Kernels (%)	90.2	57.2	91.2	92.4	71.0	10.8	98.0	80.0
	Flour Extraction (%)								
14	Tempered Wheat Basis (%)	69.4	72.4	68.8	73.2	72.9	74.7	70.6	73.0
15	Total Product Basis (%)	73.1	76.1	72.0	76.8	75.9	78.4	73.8	76.4
16	Flour /Bu Wheat (lbs)	46.6	47.0	47.2	49.0	48.5	48.3	46.8	45.7
17	Flour Color Brightness (L*)	89.9	89.6	90.2	90.3	90.0	89.8	90.2	90.2
18	Flour Color Yellowness (b*)	8.4	7.4	7.5	6.7	8.1	7.2	8.9	7.1
19	Flour Moisture (%)	12.5	13.0	13.2	13.2	13.4	12.7	13.3	12.8
20	Flour Ash (14%mb)	0.473	0.525	0.468	0.452	0.433	0.456	0.458	0.454
21	Flour FN (Malted) (sec)	252	253	259	252	252	251	247	231
	Farinograph								
22	Water Absorption (500bu)	66.1	65.9	68.6	65.9	66.1	66.2	66.5	64.9
23	Water Absorption (14%mb)	64.4	64.7	67.7	65.0	65.4	64.7	65.7	63.5
24	Arrival Time (min)	2.2	3.2	2.0	2.1	4.7	3.8	5.8	3.5
25	Peak Time (min)	6.2	5.7	3.8	3.8	9.7	5.9	13.7	7.4
26	Dough Stability (min)	10.5	6.7	6.1	6.2	11.5	6.6	14.1	11.0
27	MTI (bu)	25.0	36.0	36.0	37.0	25.0	34.0	12.0	22.0
28	TTB (min)	12.0	9.8	8.1	7.9	15.2	10.1	20.0	13.0
	II. Cooperator Results								
29	Bake Absorption (Ave %)	64.9	64.5	66.6	64.2	65.2	64.4	65.8	64.1
30	Loaf Volume (% of Check)	04.5	97.3	00.0	94.2 94.1	05.2	95.1	05.0	96.9
30	Luai Vuluine (10 UI Check)		97.3		34.1		9 5 .1		30.3

Trait	ND808 II. Cooperator Results	C9 Glenn	C12	K9 Glenn	K12	M9 Glenn	M12	W9 Glenn	W12
31	Mixing Requirement	4.0	2.7	3.5	2.8	3.5	2.7	4.1	3.6
	5 Very Long								
	4 Long								
	3 Medium								
	2 Short								
	1 Very Short								
32	Dough Characteristics	3.8	3.2	4.0	3.3	4.0	3.2	3.9	3.9
	5 Bucky-Tough								
	4 Strong-Elastic								
	3 Medium-Pliable								
	2 Mellow-Very Pliable								
	1 Weak-Short or Sticky								
33	Mixing Tolerance		2.4		2.7		2.0		2.9
	5 Much More Tolerance Than Check								
	4 More Tolerance Than Check								
	3 Tolerance Equivalent To Check								
	2 Less Tolerance Than Check								
	1 Much Less Tolerance Than Check								
34	Internal Crumb Color		3.5		3.7		3.3		4.0
	5 Much Brighter Than Check								
	4 Brighter Than Check								
	3 Equivalent To Check								
	2 Poorer Than Check								
	1 Much Poorer Than Check								
35	Internal Grain and Texture		3.4		3.3		3.4		3.6
	5 Much Better Than Check								
	4 Better Than Check								
	3 Equivalent To Check								
	2 Poorer Than Check								
	1 Much Poorer Than Check								
	III. Cooperator Evaluation								
	Quality Trait 1-2: Protein		2.8		1.4		2.1		2.4
	5 Much Better Than Check								
	4 Better Than Check								
	3 Equivalent To Check								
	2 Poorer Than Check								
	1 Much Poorer Than Check								
	Quality Trait 3-21: Milling		3.4		3.9		3.5		3.3
	5 Much Better Than Check								
	4 Better Than Check								
	3 Equivalent To Check								
	2 Poorer Than Check								
	1 Much Poorer Than Check								
	Quality Trait 22-35: Baking		2.8		2.6		3.0		2.9
	5 Much Better Than Check								
	4 Better Than Check								
	3 Equivalent To Check								
	2 Poorer Than Check								
	1 Much Poorer Than Check								
	Quality Trait 1-35: Overall Comparison		2.8		2.7		2.6		3.0
	5 Much Better Than Check								
	4 Better Than Check								
	3 Equivalent To Check								
	2 Poorer Than Check								
	1 Much Poorer Than Check								

SD4011

13.6

TTB (min)

13.1

Trait	SD4011 I. USDA/ARS WQL Data	B9 Glenn	B13
1	Wheat Protein (12%mb)	15.5	15.5
2	Flour Protein (12%mb)	15.2	15.2
3	Market Value (Score 1-6)	4.8	4.2
4	Market Value (Score 1-10)	10	8.8
5	Test Weight (Ib/bu)	63.3	59.8
6	1000 Kernel Weight (g)	35.6	34.1
7	Kernel Size % Large	79	76
8	Kernel Size % Small	3	4
9	Wheat Moisture (%)	10.8	10.5
10	Wheat Ash (14%mb)	1.57	1.53
11	Wheat Falling Number (sec)	400	447
12	SKCS Hardness Index	83.7	71.4
13	Vitreous Kernels (%)	92.0	62.3
	Flour Extraction (%)		
14	Tempered Wheat Basis (%)	69.9	72.3
15	Total Product Basis (%)	73.7	74.5
16	Flour /Bu Wheat (Ibs)	46.2	45.3
17	Flour Color Brightness (L*)	89.8	89.8
18	Flour Color Yellowness (b*)	8.2	8.3
19	Flour Moisture (%)	13.3	12.9
20	Flour Ash (14%mb)	0.518	0.507
21	Flour FN (Malted) (sec)	251	257
	Farinograph		
22	Water Absorption (500bu)	68.8	69.2
23	Water Absorption (14%mb)	68.0	68.0
24	Arrival Time (min)	3.9	4.5
25	Peak Time (min)	8.0	7.4
26	Dough Stability (min)	10.1	7.6
27	MTI (bu)	26.0	28.0
20		126	12.4

II. Cooperator Results Bake Absorption (Ave %) 29 66.7 66.9 Loaf Volume (% of Check) 97.4 30

28

	SD4011	B9	B13
Trait	II. Cooperator Results	Glenn	
31	Mixing Requirement	3.7	2.6
	5 Very Long		
	4 Long		
	3 Medium		
	2 Short		
	1 Very Short		
32	Dough Characteristics	4.0	2.4
	5 Bucky-Tough		
	4 Strong-Elastic		
	3 Medium-Pliable		
	2 Mellow-Very Pliable		
	1 Weak-Short or Sticky		
33	Mixing Tolerance		2.2
55	5 Much More Tolerance Than Check		2.2
	4 More Tolerance Than Check		
	3 Tolerance Equivalent To Check		
	2 Less Tolerance Than Check		
	1 Much Less Tolerance Than Check		
34	Internal Crumb Color		2.6
	5 Much Brighter Than Check		
	4 Brighter Than Check		
	3 Equivalent To Check		
	2 Poorer Than Check		
	1 Much Poorer Than Check		
35	Internal Grain and Texture		3.1
	5 Much Better Than Check		
	4 Better Than Check		
	3 Equivalent To Check		
	2 Poorer Than Check		
	1 Much Poorer Than Check		
	III. Cooperator Evaluation		
	Quality Trait 1-2: Protein		3.0
	5 Much Better Than Check		
	4 Better Than Check		
	3 Equivalent To Check		
	2 Poorer Than Check		
	1 Much Poorer Than Check		
	Quality Trait 3-21: Milling		3.0
	5 Much Better Than Check		
	4 Better Than Check		
	3 Equivalent To Check		
	2 Poorer Than Check		
	1 Much Poorer Than Check		
	Quality Trait 22-35: Baking		2.4
	5 Much Better Than Check		2.7
	4 Better Than Check		
	3 Equivalent To Check		
	2 Poorer Than Check		
	2 Poorer Than Check 1 Much Poorer Than Check		
			27
	Quality Trait 1-35: Overall Comparison		2.7
	5 Much Better Than Check		
	4 Better Than Check		
	3 Equivalent To Check		
	2 Poorer Than Check		
	1 Much Poorer Than Check		

CA905-781

Trait	CA905-781 I. USDA/ARS WQL Data	W9 Glenn	W14
1	Wheat Protein (12%mb)	16.2	15.8
2	Flour Protein (12%mb)	16.2	15.8
3	Market Value (Score 1-6)	4.8	4.2
4	Market Value (Score 1-10)	10	8.8
5	Test Weight (lb/bu)	62.4	59.4
6	1000 Kernel Weight (g)	28.4	31.7
7	Kernel Size % Large	27	50
8	Kernel Size % Small	11	8
9	Wheat Moisture (%)	9.4	9.8
10	Wheat Ash (14%mb)	1.44	1.46
11	Wheat Falling Number (sec)	464	479
12	SKCS Hardness Index	76.6	62.8
13	Vitreous Kernels (%)	98.0	82.1
	Flour Extraction (%)		
14	Tempered Wheat Basis (%)	70.6	72.2
15	Total Product Basis (%)	73.8	75.8
16	Flour /Bu Wheat (lbs)	46.8	45.5
17	Flour Color Brightness (L*)	90.2	89.9
18	Flour Color Yellowness (b*)	8.9	8.2
19	Flour Moisture (%)	13.3	13.1
20	Flour Ash (14%mb)	0.458	0.472
21	Flour FN (Malted) (sec)	247	249
	Farinograph		
22	Water Absorption (500bu)	66.5	64.2
23	Water Absorption (14%mb)	65.7	63.2
24	Arrival Time (min)	5.8	3.9

25	Peak Time (min)	13.7	9.3
26	Dough Stability (min)	14.1	16.0
27	MTI (bu)	12.0	16.0
28	TTB (min)	20.0	20.0

II. Cooperator Results29Bake Absorption (Ave %)30Loaf Volume (% of Check)99.4

	CA905-781	W9	W14
Trait	II. Cooperator Results	Glenn	
31	Mixing Requirement	4.1	4.0
	5 Very Long		
	4 Long		
	3 Medium 2 Short		
	2 Short 1 Very Short		
32	Dough Characteristics	3.9	4.1
52	5 Bucky-Tough	5.5	7.1
	4 Strong-Elastic		
	3 Medium-Pliable		
	2 Mellow-Very Pliable		
	1 Weak-Short or Sticky		
33	Mixing Tolerance		3.3
	5 Much More Tolerance Than Check		
	4 More Tolerance Than Check		
	3 Tolerance Equivalent To Check		
	2 Less Tolerance Than Check		
	1 Much Less Tolerance Than Check		
34	Internal Crumb Color		3.6
	5 Much Brighter Than Check		
	4 Brighter Than Check		
	3 Equivalent To Check		
	2 Poorer Than Check		
	1 Much Poorer Than Check		
35	Internal Grain and Texture		3.2
	5 Much Better Than Check 4 Better Than Check		
	3 Equivalent To Check		
	2 Poorer Than Check		
	1 Much Poorer Than Check		
	III. Cooperator Evaluation		2.8
	Quality Trait 1-2: Protein		
	5 Much Better Than Check		
	4 Better Than Check		
	3 Equivalent To Check		
	2 Poorer Than Check		
	1 Much Poorer Than Check		
	Quality Trait 3-21: Milling		3.3
	5 Much Better Than Check		
	4 Better Than Check		
	3 Equivalent To Check		
	2 Poorer Than Check		
	1 Much Poorer Than Check		2.4
	Quality Trait 22-35: Baking		3.1
	5 Much Better Than Check 4 Better Than Check		
	3 Equivalent To Check		
	2 Poorer Than Check		
	1 Much Poorer Than Check		
	Quality Trait 1-35: Overall Comparison		3.4
	5 Much Better Than Check		
	4 Better Than Check		
	3 Equivalent To Check		
	2 Poorer Than Check		
	1 Much Poorer Than Check		

Glenn Checks 2009, 2008, 2007 Crop Years

Water om Bake Loaf Muing Dough Bake		<u>20</u>	09 Hard	Spring Wheat	Crop	<u>20</u>	08 Hard	Spring Wheat	Crop	<u>20</u>	07 Hard	Spring Wheat	Crop
1 61.0 2720 4 3 66.0 28.0 5 5 2 86.0 28.0 3 86.0 28.0 5 5 3 86.0 28.0 3 86.0 28.0 5 7 87.0 22.5 5 5 6 70.0 29.7 4 5 70.0 23.2 5 7 87.3 10.0 3 4 63.0 99.0 3 3 62.0 99.0 3 3 62.0 99.0 4 4 4 3 61.0 89.0 7.0 4 4 4 3 61.0 89.0 2.2 3 3 5 3 3 7 8 3 5 3 3 7 3 8 62.0 3 3 5 3 3 62.0 3 3 62.0 3 3 62.0 3 3 62.0 3 3				•	•			•	•			•	•
2 65.0 2820 3 4 60.7 27.00 2 3 4 60.0 3048 5 60.0 3013 5 60.0 20.44 5 5 60.0 3013 5 5 60.0 20.44 5 5 6 77.3 1035 3 4 30.9 71.0 5 2.65.0 77.8 4 3 7 70.7 1005 3 4 85.0 7.1 10.0 5 7.2 3 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0	• .												
3 64-0 1033 5 4 62.0 997 4 5 61.0 307 2 4 6 70.0 3075 3 3 65.0 2050 2 5 64.8 3205 2 2 64.8 3205 2 65.0 2000 2 65.0 2000 2 65.0 2000 2 65.0 2000 2 65.0 2000 2 65.0 2000 2 65.0 2000 77.0 4 3.0 4 64.0 3.0 4 64.0 3.0 4 64.0 3.0 4 64.0 3.0 4 65.0 3.0 3.0 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 6 6 3.0 6 3.0 6 3.0 6 3.0													
5 700 3075 3 6 5 2000 2 5 64.8 2425 2 3 7 673 1025 3 650 270 5 2 650 770 5 2 655 770 4 430 9 771 1002 3.7 6.0 6.31 7.77 3.8 62.5 7.78 3.8 4007 7.1 0.02 3.7 6.0 6.31 6.37 3.8 62.5 7.78 3.8 0.22 7.78 3.8 0.22 7.78 3.9 0.90 7.78 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8 7.													
6 65.0 2750 4 3 63.0 915 4 3 62.0 24.50 2 3 7 7 1 1000 4 5 3 4 63.0 710 5 2 65.5 77.8 4 3 9 71.7 10102 3 6 64.3 77.0 10 12.5 2.2 3.5 4 60.0 30.00 5 5 9.0 77.7 3.8 62.0 2.00 Moting Dough Bake Lot Moting Dough Bake 12.0 13.0 12.0 13.0 12.0 13.0 12.0 13.0 12.0 13.0 12.0 13.0 12.0 13.0 12.0 13.0 12.0 13.0 12.0 13.0 12.0 13.0 12.0 13.0 12.0 13.0 12.0 13.0 13.0 13.0 13.0 13.0 13.0 13.0 13.0 13.0	4	66.0	3045	5		65.0	3015		5	63.0	3104	5	5
77.3 1035 3 4 6.39 915 4 3 61.3 870 4 4 9 77.2 1035 3 4 65.4 77.5 2 65.5 77.8 4 5 9 77.2 1.38 3 4 65.5 77.6 4 65.5 77.8 4 65.5 77.8 4 65.5 77.8 4 65.5 77.8 4 65.5 77.8 4 65.5 77.8 4 65.5 77.8 4.5 65.5 77.8 4.5 1.35 65.5 77.8 4.6 1.30 90.9 2.27 3 3 6.6 90.9 5 5 60.0 207.5 5 60.0 207.5 3 3 6.6 90.9 3 3 6.6 90.9 3 3 6.6 90.9 3 3 6.6 90.9 3 3 6.6 90.9 3 3 <td< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></td<>													
8 70.4 1000 4 5 63.7 70 5 2 65.8 77.8 4 3 10 71.1 1002 3 5 3.7 3.8 62.5 72.8 3.8 2 66.7 3.7 7.4 6.1 3.7 3.8 62.5 72.8 3.8 2 66.7 3.7 4.0 6.1 3.7 3.8 62.5 5.2 3.8 60.0 3000 5 50.0 72.7 3.8 62.0 20.0 3.2 3 62.0 20.0 3.5 5.2 2 66.0 3000 5 50.0 72.7 3.8 62.0 20.0 3.2 62.0 20.0 3.3 3.3 62.0 20.0 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3													
9 67.2 1035 3 4 68.4 835 3 4 725 33 5 4 100 3.7 3.8 62.7 3.7 3.8 62.7 3.3 62.7 3.3 62.7 3.8 62.7 3.8 62.7 3.8 62.7 3.8 62.7 3.8 62.7 3.8 62.7 3.8 62.7 3.8 62.7 3.8 62.7 3.8 62.7 3.8 62.7 3.8 62.7 3.8 62.7 3.8 62.7 3.8 62.7 3.8 62.7 3.8 62.7 3.8 62.7 3.8 62.7 3.8 62.7 3.8 62.7 3.8 62.7 3.3 64.7 62.7 3.3 64.7 62.7 3.3 64.7 62.7 3.3 64.7 62.7 92.7 3.3 64.7 62.7 92.7 3.3 64.7 62.7 92.7 3.3 62.7 92.7 93.7 3.3 <t< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></t<>													
10 71.1 1002 3 5 42 marge ±1 3t Dev 3.2 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 <													
Average 66.7 3.7 4.0 63.1 5.7 3.8 62.5 5.2 3.9 Classelon Bake Loaf Minng Dough Bake Loaf Minng Dough Gaselon Bake Loaf Minng Dough Bake Loaf Minng Dough 0019 3000 5 5 93.0 27.2 3 3 62.0 27.0 5 5 3 64.0 1000 5 5 66.0 227.0 3 3 62.0 228.0 3 3 4 65.0 2000 4 4 64.0 27.6 5 66.0 207.5 3 3 64.0 28.0 3 3 7 64.6 102.5 3 64.7 91.0 3 4 67.2 91.0 3 3 64.7 90.0 1.0 8 65.0 10.0 3.8 64.4 3						0	000	U U		0010	. 20	U U	Ŭ
Casepartor Bale Lai Mixing Dough Bale Mixing Dough Bale Lai Bale Bale Lai Bale Lai Bale L	Average			3.7	4.0	63.1		3.7	3.8	62.5		3.2	3.9
Cooperator Absorption Volume Requirement Characteristic Absorption Volume Requirement Characteristic 1 61.5 2200 3 3 62.0 275 5 5 3 64.0 1000 5 5 66.0 295 5 66.0 296 5 5 66.0 296 5 66.0 296 5 66.0 296 5 66.0 296 5 66.0 296 5 66.0 296 5 66.0 296 5 66.0 296 5 66.0 296 5 5 66.0 296 5 5 66.0 296 5 5 66.0 296 5 5 66.0 296 5 5 66.0 296 5 5 66.0 296 5 5 66.0 296 5 5 66.0 296 5 5 65.0 296 5 5 <td< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></td<>													
1 60.0 3000 5 5 50.0 9725 3 3 62.0 2475 5 5 2 64.0 1080 5 4 64.0 975 4 3 64.0 998 4 4 4 65.0 2000 4 5 66.0 2956 5 5 66.0 3075 3 3 62.0 307 3 3 62.0 307 3 3 62.0 307 3 3 62.0 307 3 3 62.0 307 3 3 62.0 307 3 3 62.0 307 3 3 62.0 307 3 3 62.0 307 3 3 62.0 307 3 3 62.0 307 3 3 62.0 307 3 3 62.0 307 3 3 62.0 307 3 3 62.0 307 3 3 62.0 307 3 60.0 300 4 4 61.0 3000 <t< th=""><th></th><th></th><th></th><th></th><th>•</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></t<>					•								
261528003362.031504564.099644465.030005566.0295566.065.066.0296566.02965566.02965566.02965566.02965566.02965566.02963364.02863364.028628666.02863364.731666.780.02804466.080.028.066.780.03466.780.03466.780.03466.780.03466.780.0466.080.04466.080.04466.080.04466.080.04466.080.04466.080.04460.020.0100010001001001001010101010101010101010100100100100101010101010101010<	•												
3 64.0 1060 5 4 64.0 975 4 3 64.0 986 4 4 5 66.4 2825 3 3 66.0 2875 2 5 66.0 3075 3 3 7 64.6 1025 3 4 65.5 590 3 3 62.5 1005 4 4 8 0707 1015 5 3 46.0 79.5 3 3.4 67.2 998 5 5 3 3 10 8637 1010 4.0 3.8 64.4 3.3 3.4 67.2 998 5 5 110 807 1.3 0.3 4.3 2.3 4.4 6.0 70.4 4.4 6.0 70.0 1.4 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 <													
4 66.0 3000 5 5 66.0 2286 5 5 63.0 2886 5 5 6 63.0 2280 4 44 64.0 2750 3 3 64.0 2850 3 3 7 64.6 10.25 3 44 65.7 90 3 44 67.2 918 5 3 4 67.2 918 5 3 4 67.2 918 5 3 4 67.2 918 5 3 4 67.2 918 5 3 4 67.2 919 0.9 1 1 3 4 67.2 919 0.9 1 0 9 0.1 1 1 0.9 0.9 1.0 0 900 1.0 0 900 1 0 9 1.0 0 900 1.0 0 900 1.0 0 900 1 0 900 1.0 0 900 1.0 0 900 1.0 0 900 1.0													
6 63.0 2900 4 4 64.0 2750 3 3 64.0 2850 3 3 7 64.6 1025 3 44 67.2 918 5 3 9 65.1 390 3 4 67.2 918 5 3 4 Reray 64.9 100 4 3.2 0.3 3.3 9 64.3 3.9 3.7 2 64.9 1.0 0.4 3.8 64.4 1.0.3 0.9 1.0 0.9 1.0 Crookston Noume Requirement Characteristic Read Add 4.0 3.30 5.0 2.00 3 3 3.3 10 55.0 2.00 3 3 66.0 2.00 3 3.0 5.0 3.0 3.0 5.0 3.0 3.0 5.0 3.0 3.0 5.0 3.0 3.0 5.0 3.0 3.0 <	4	65.0	3000		5	66.0	2956	5	5	63.0	2986	5	5
764.610253465.595.033462.5100544896.199.034466.099.034466.789.03341065.710104.03.36.1.3.3.3.3.96.1.3.3.9.3.7.3.7111503.20.90.82.60.90.99.98.8LoatMixingDoughBakeLoatMixingDoughCocyCooperatorBakeLoatMixingDoughBakeLoatMixingDoughBakeLoatMixingDough150.029004460.030004466.030004460.01150.029002460.030004460.030004460.0300055465.029002465.029004460.030004460.030004460.030005630.030.0556566770.070.070.070.070.070.070.070.070.070.070.070.070.070.070.070.070.070.070.070.070.070.070.070.070.070.070.070.070.070.0													
870.79155364.79163467.291853965.19603466.0980361.780.780.93.961.780.93.97.0486.40.90.90.91.90.91.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0001.00.0000.0000.0000.000													
9 65.1 960 3 4 960 3 4 96.7 100 4 3 Average 64.3 0.0 3.8 64.3 3.3 9.9 64.3 5.9 3.7 11 Std Dev Bake Laf Mxing Dough Bake Laf Mxing Dough Cooperator Assorption Volume Requirement Characteristic Assorption Volume Requirement Characteristic Assorption Volume Requirement Characteristic 64.5 2900 4 660 3000 4 660 3000 4 610 3000 5 2 64.5 2900 4 660 3000 4 4 610 3000 3 610 64.5 500 290 4 660 3000 4 4 620 230 3 4 6 650 2900 4 4 633 300 3 645 300 3 4													
10 68.7 1010 4 3 Average *1 Stol Dev 64.9 0.9 0.9 1.9 0.0,9 1.0 Crookston Bake Loaf Mixing Dough Bake Loaf Mixing Dough 150 2.900 4 4 60.0 3000 4 5 64.3 3350 3 2 64.5 2.800 3 4 60.0 2000 4 4 64.3 3350 3 3 3 64.6 2.800 3 4 60.0 2.900 4 4 60.0 2.900 4 4 64.3 3350 3 4 4 66.0 310.4 5 66.3 3.00 4 4 66.0 2.986 5 5 6 6.7.2 2.975 3 4 6.3.3 3.0 2.9 9.0.3 3.4 10 7.1 9.89 4 4													
Average 64.9 4.0 3.8 64.4 3.3 3.9 64.3 3.9 3.7 15 Id Dev Crookston Bake Lat Mixing Dough Bake Lat Mixing Dough Absorption Volume Requirement Characteristic Absorption Volume Requirement Characteristic Absorption Volume Requirement Characteristic Absorption Volume Requirement Characteristic 64.5 2900 4 66.0 3000 5 5 66.0 2986 5 5 6 66.0 2900 4 4 66.0 3102 3 66.0 2986 5 5 6 66.7 2900 2 4 66.3 3102 3 68.0 2886 5 5 6 65.0 2700 2 3 66.7 1020 3 64.5 3.00 3 4 6 65.0 2700 2 3 66.7 100 3 64.1						00.0	500	5	4	00.7	000	5	7
i 1 Sti Dev 3.2 0.9 0.8 2.6 0.9 0.9 1.9 0.9 1.0 Crookston Absorption Volume Requirement Characteristic Absorption Volume Requirement Characteristic Absorption Volume Requirement Characteristic 1 59.0 2.900 4 4 0.00 200 4 4 61.0 3000 5 5 2 64.5 2.800 3 3 3 4 61.0 3000 5 5 3 63.0 950 4 4 64.0 205.0 296 5 5 66.0 2986 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5						64.4		3.3	3.9	64.3		3.9	3.7
Cooperator Absorption Volume Requirement Characteristic Absorption Volume Requirement Characteristic Absorption Volume Requirement Characteristic Characteristic 1 59.0 2900 4 40 61.0 3000 5 5 64.5 2800 3 3 64.0 3350 3 5 6 63.0 3104 5 5 66.0 2986 5 5 6 69.0 2700 2 3 63.0 3000 4 4 64.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0 246.0	±1 Std Dev	3.2		0.9	0.8	2.6		0.9	0.9	1.9			1.0
1 590 2900 4 4 600 3000 4 4 4 610 3000 5 5 2 64.5 2800 3 3 60.0 2900 4 5 64.3 3350 3 3 3 66.0 3904 5 5 64.3 3300 3 4 4 66.0 2700 2 4 66.3 3125 4 3 68.1 3300 3 4 6 65.0 2700 2 3 63.0 3000 4 4 4 7 67.1 950 4 4 63.6 1030 3 3 64.6 1045 3 4 7 67.1 889 4 4 63.6 3.7 3.8 65.3 3.7 4.2 9 67.2 87.5 3.4 64.0 100 7 2.4 0.9 1.0													
2 84.5 2800 3 3 60.0 290 4 5 64.3 3300 3 3 3 3630 300 15 5 65.0 2986 5 66.0 2986 5 5 66.0 2986 5 5 66.0 2986 5 5 66.0 2986 5 5 66.0 2986 5 5 66.0 2986 5 5 66.0 2980 3 4 4 66.0 2980 3 4 4 66.0 2980 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 6 10 7 24 0.9 1.0 2.9 0.9 0.7 4.1 10 7 2.4 0.9 1.0 2.9 0.9 0.7 4.1 4.0 9 3.3 3 3 6.5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	•												
3 63.0 950 4 4 64.0 1075 4 4 62.0 923 3 4 4 66.0 3104 5 50 296 5 5 68.1 3300 3 4 6 65.0 2700 2 3 63.0 3000 4 4 64.6 1048 3300 3 4 7 76.1 950 4 44 66.6 1030 3 34 4 5 9 67.2 875 3 4 66.7 1020 2 2 69.8 983 4 5 9 67.2 875 3 4 4 66.7 1020 2 2 69.8 983 4 5 10 66.6 1.1 0.7 2.4 0.9 1.0 2.9 0.9 0.7 4.2 0.9 1.0 2.9 0.9 0.7 4.2 0.9 0.7 4.2 0.9 0.7 4.2 0.9 0.7 4.2 0													
4 66.0 3104 5 5 66.0 2286 5 5 66.0 2286 5 5 5 69.7 2000 2 4 63.0 3102 4 3 66.0 2280 4 4 6 65.0 2700 2 3 63.0 3000 4 4 64.0 2400 4 4 7 67.1 960 4 4 63.6 7020 2 28.98 89.8 3.4 5 9 67.2 875 3 4 63.6 3.77 3.8 65.3 3.0 7.2 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1													
6 65.0 2700 2 3 63.0 3000 4 4 64.6 1045 3 4 7 67.1 950 4 4 63.6 1030 3 3 64.6 1045 3 4 8 73.0 900 4 5 66.7 1020 2 2 68.0 880 4 5 9 67.2 87.7 3 4 64.1 885 3 4 68.0 880 3 4 5 10 71.6 889 4 4 67.0 7.7 3.8 65.3 3.7 4.2 400 Bake Loaf Mixing Dough 7.7 3.8 65.3 3.7 4.2 1 61.0 2850 3 3 3 65.7 5.5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 6 4 4 4	4				5		2986	5				5	5
7 67.1 950 4 4 63.6 1030 3 3 64.6 1045 3 4 8 73.0 900 4 5 66.7 1020 2 2 69.8 983 4 5 9 67.2 875 3 4 66.7 1020 2 2 68.0 880 3 4 10 71.6 889 4 4 68.0 3.7 3.8 65.3 3.7 4.2 20 66.6 3.5 4.0 65.6 3.7 3.8 65.3 3.7 4.2 10 61.0 2850 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 6 7.4 3 3 4 4 5 5 5													
8 73.0 900 4 5 66.7 1020 2 2 69.8 983 4 5 9 67.2 875 3 4 66.1 885 3 4 68.0 880 3 4 10 71.6 889 4 4 65.3 3.7 3.8 65.3 3.7 4.2 11 10.0 0.7 2.4 0.9 1.0 2.9 0.9 0.7 Minot Bake Lad Mixing Dough 2.4 0.9 1.0 2.9 0.9 0.7 Cooperator Absorption Volume Requirement Characteristic 5 5 67.4 3200 3 4 4 4 65.0 3104 5 5 5 67.4 3200 3 4 4 4 4 4 4 4 4 4 6 9 63.3 885 2 4 4 4													
9 7.2 875 3 4 66.1 880 3 4 66.0 880 3 4 Average ±15td Dev Minot 66.6 3.5 4.0 63.6 3.7 3.8 65.3 3.7 4.2 Minot Bake Loaf Mixing Dough 0.36 3.7 3.8 65.3 3.7 4.2 Cooperator Absorption Volume Requirement Characteristic 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 6 7.4 3200 3 4 4 4 68.5 1034 4 4 6 6.1 190 3 4 4 4 4 4													
10 71.6 889 4 4 Average 66.6 3.5 4.0 63.6 3.7 3.8 65.3 3.7 4.2 Minot Bake Loa Mixing Dough Volume Requirement Characteristic Cooperator Absorption Volume Requirement Characteristic Volume Requirement Characteristic 1 61.0 2850 3 3 3 64.0 1038 4 4 4 65.0 3104 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 6 64.0 1908 3 4 4 65.5 1334 2 4 4 5 5 5 5 5 5 5 5 5 5 <													
Average 66.6 3.5 4.0 63.6 3.7 3.8 65.3 3.7 4.2 Minot Bake Loaf Mixing Dough 0.7 2.4 0.9 1.0 2.9 0.9 0.7 Minot Bake Loaf Mixing Dough 0.9 1.0 2.9 0.9 0.7 1 61.0 2850 5 5 2 62.5 3050 3 3 3 4 4 65.0 3104 5 5 6 64.0 2950 4 4 6 64.0 2950 4 4 6 0.9 3 3 6 64.0 1090 3 4.0 4.0 4.0 4.0 9 64.3 885 2 4.0 4.0 4.0 4.0 9 64.3 80.5 2 5 6.0 4.0 Mixing Dough Bake						01.1	000	Ũ		00.0	000	Ũ	
Minot Cooperator AbsorptionBake Volume Requirement CharacteristicKaracteristic Characteristic166.0285055262.5305033364.0103844466.0310455567.4320033664.0295044764.6109034870.2100044966.3103424465.0292044966.31034241068.5103424Average65.215.54.0±1 std Dev2.81.55.0263.0330364.0109854.01068.510342.044.03.01162.02.8556.02.955556.0310936.03109336.03.0043.03.056.03.0456.03.0444.046.056.06.03.006.03.006.03.006.03.006.03.006.03.006.03.0076.0 </th <th>Average</th> <th></th> <th></th> <th>3.5</th> <th>4.0</th> <th>63.6</th> <th></th> <th>3.7</th> <th>3.8</th> <th>65.3</th> <th></th> <th>3.7</th> <th>4.2</th>	Average			3.5	4.0	63.6		3.7	3.8	65.3		3.7	4.2
Cooperator Absorption Volume Requirement Characteristic 1 61.0 280 5 5 2 62.5 3050 3 3 3 64.0 1038 4 4 4 65.0 3104 5 5 6 67.4 3200 3 4 6 64.0 2950 4 44 7 64.6 1090 3 4 8 70.2 1000 4 4 9 64.3 885 2 4 9 64.3 885 2 4 10 68.5 1.1 0.7 Willison Bake Loaf Mixing Dough Average 65.2 3.5 6.0 292 5 5 1 62.0 2.80 5 6.20 2.80 5 5 5 2 63.0 3100						2.4		0.9	1.0	2.9		0.9	0.7
1 61.0 2850 5 5 2 62.5 3050 3 3 3 64.0 1038 4 4 4 65.0 3104 5 5 5 67.4 3200 3 3 6 64.0 2950 4 4 7 64.6 1090 3 4 8 70.2 1000 4 4 9 64.3 885 2 4 Average 65.2 3.5 4.0 *1 StdDev 2.8 1.1 0.7 Williston Bake Loaf Mixing Dough Absorption Volume Requirement Characteristic Absorption Volume Requirement Characteristic 1 60.0 3162 5 5 65.0 2925 5 5 2 63.0 3100 3 58.0 305 4 5 65.0 2925 5 5 5 5 5 5				•	•								
2 62.5 3050 3 3 3 64.0 1038 4 4 4 65.0 3104 5 5 5 67.4 3200 3 3 6 64.0 2950 4 4 7 64.6 1090 3 4 8 70.2 1000 4 4 9 64.3 885 2 4 10 68.5 1034 2 4 Average 65.2 .3.5 4.0 ±1 Std Dev 2.8 1.1 0.7 Williston Bake Loaf Mixing Dough thsorption Volume Requirement Characteristic Absorption Volume Requirement 1 62.0 2850 5 6 65.0 2925 5 5 2 63.0 3100 3 3 58.0 3050 4 5 65.0 3045 5 5 2 63.0 3108													
3 64.0 1038 4 4 4 65.0 3104 5 5 67.4 3200 3 3 6 64.0 2950 4 4 7 64.6 1090 3 4 9 64.3 885 2 4 9 64.3 885 2 4 10 68.5 1034 2 4 Average 65.2 3.5 4.0 ±1 Sid Dev 2.8 1.1 0.7 Williston Absorptio Volume Requirement Characteristic Absorptio Volume Requirement 1 62.0 285 5 62.0 2850 5 65.0 2925 5 5 2 63.0 3100 3 3 58.0 3050 4 5 65.2 3400 3 3 3 64.0 1098 5 4 64.0 3162 5 5 65.0 3045 5 5													
5 67.4 3200 3 3 6 64.0 2950 4 4 7 64.6 1090 3 4 9 64.3 885 2 4 9 64.3 885 2 4 9 64.3 885 2 4 10 68.5 1034 2 4 Average 65.2 3.5 4.0 ±1 Std Dev 2. 1.1 0.7 Williston Bake Loaf Mixing Dough Absorption Volume Requirement Characteristic 1 62.0 2850 5 5 5 65.0 292 5 5 2 63.0 310 3 36 64.0 1008 4 4 4 66.0 3162 5 5 64.0 1008 4 4 4 66.0 3162 5 5 64.0 1008 4 4 4 66.0 3162 5 <th></th>													
6 64.0 2950 4 4 7 64.6 1090 3 4 8 70.2 1000 4 4 9 64.3 885 2 4 9 64.3 885 2 4 10 68.5 1034 2 4 Average 65.2 3.5 4.0 ± 1 Std Dev 2.8 1.1 0.7 Williston Bake Loaf Mixing Dough Bake Loaf Mixing Dough Characteristic Absorption Volume Requirement Characteristic </th <th>4</th> <th>65.0</th> <th>3104</th> <th>5</th> <th>5</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>	4	65.0	3104	5	5								
7 64.6 1090 3 4 8 70.2 1000 4 4 9 64.3 885 2 4 9 64.3 885 2 4 Average 65.2 1034 2 4 Average 65.2 3.5 4.0 ± 1 Std Dev 2.8 1.1 0.7 Williston Bake Loaf Mixing Dough Absorption Volume Requirement Characteristic Absorption Volume Requirement Characteristic Absorption Volume Requirement Characteristic Absorption Volume Requirement Characteristic 1 62.0 2850 5 5 65.0 2925 5 5 2 63.0 3100 3 358.0 3050 4 5 65.0 2925 5 5 3 64.0 1098 5 4 64.0 1125 5 5 65.0 3045 5 5 5 5 5													
8 70.2 1000 4 4 9 64.3 885 2 4 10 68.5 1034 2 4 Average 65.2 3.5 4.0 ± 1 Std Dev 2.8 1.1 0.7 Williston Bake Loaf Mixing Dough Bake Loaf Mixing Dough 6 6.0 2850 5 62.0 2850 5 66.0 2925 5 5 2 63.0 3100 3 36 56.0 2925 5 5 5 2 63.0 3100 3 36 3050 4 5 66.0 2925 5 5 2 63.0 3100 3 36 3050 4 5 66.0 2925 5 5 5 2 63.0 3162 5 5 66.0 3045 5 5 5 5 5 5 5 5 5 5 5 5 5 <th< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></th<>													
9 64.3 885 2 4 10 68.5 1034 2 4 Average 65.2 3.5 4.0 ± 1 Std Dev 2.8 1.1 0.7 Williston Bake Loaf Mixing Dough Bake Loaf Mixing Dough 66.0 2850 5 62.0 2850 5 65.0 2925 5 5 2 63.0 3100 3 3 58.0 3050 4 5 65.2 3400 3 3 3 64.0 1098 5 4 66.0 3162 5 65.0 2925 5 5 4 66.0 3162 5 62.0 2850 4 5 65.2 3400 3 3 4 66.0 3162 5 5 64.0 1008 4 4 4 66.0 3162 5 5 64.0 1008 4 4 5 67.7 3250 4													
10 68.5 1034 2 4 Average 65.2 3.5 4.0 ±1 Std Dev 2.8 1.1 0.7 Williston Bake Loaf Mixing Dough Bake Loaf Mixing Dough Cooperator Absorption Volume Requirement Characteristic Absorption Volume Requirement Characteristic 1 62.0 2850 5 62.0 2850 5 65.0 2925 5 5 2 63.0 3100 3 3 58.0 3050 4 5 65.2 3400 3 3 3 64.0 1098 5 4 64.0 1125 5 5 65.0 2925 5 5 2 63.0 3162 5 4 64.0 1125 5 5 64.0 1008 4 4 4 66.0 3162 5 4 63.0 3162 5 5 5 5 5 5 5													
Average ±1 Std Dev65.23.54.0±1 Std Dev2.81.10.7WillistonBakeLoafMixingDoughDoughBakeLoafMixingDoughCooperatorAbsorptionVolume RequirementCharacteristicAbsorptionVolume RequirementCharacteristicAbsorptionVolume RequirementCharacteristic162.02850562.028505565.0292555263.031003358.030504565.2340033364.010985464.011255564.0100844466.031625565.0304555555567.732504265.1285043667.2320043664.029005462.029505465.02000555664.010284265.128504363.71150333664.029005463.011104363.71150333664.012253463.011104363.71150333964.810353463.08253 </th <th></th> <th></th> <th></th> <th>2</th> <th>4</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>				2	4								
WillistonBakeLoafMixingDoughBakeLoafMixingDoughBakeLoafMixingDoughCooperatorAbsorptionVolumeRequirementCharacteristicAbsorptionVolumeRequirementCharacteristicAbsorptionVolumeRequirementCharacteristicAbsorptionVolumeRequirementCharacteristicAbsorptionVolumeRequirementCharacteristicAbsorptionVolumeRequirementCharacteristicAbsorptionVolumeRequirementCharacteristicAbsorptionVolumeRequirementCharacteristicAbsorptionVolumeRequirementCharacteristicAbsorptionVolumeRequirementCharacteristicAbsorptionVolumeRequirementCharacteristicAbsorptionVolumeRequirementCharacteristicAbsorptionVolumeRequirementCharacteristicAbsorptionVolumeRequirementCharacteristicAbsorptionVolumeRequirementCharacteristicAbsorptionVolumeRequirementCharacteristicAbsorptionVolumeRequirementCharacteristicAbsorptionVolumeRequirementCharacteristicAbsorptionVolumeRequirementCharacteristicAbsorptionVolumeRequirementCharacteristicAbsorptionVolumeRequirementCharacteristicAbsorptionVolumeRequirementCharacteristicAbsorptionCharacteristicAbsorptionAbsorptionVolumeRequirementCharacteri		65.2											
Cooperator Absorption Volume Requirement Characteristic 1 62.0 2850 5 5 65.0 2925 5 5 2 63.0 3100 3 3 58.0 3050 4 5 65.2 3400 3 3 3 64.0 1098 5 4 66.0 3162 5 5 66.0 3045 5 5 5 67.7 3250 4 2 65.1 2850 4 3 67.2 3200 4 3 6 64.0 2900 5 4 62.0 2950 5 4 65.0 2600 5 5 7 65.0 1225 3 4 63.0 1110 4			1.0-1			Dali	1.4-4	Max 1 and	Desist	Delt	1.6-1	NAL 1	Devist
1 62.0 2850 5 5 62.0 2850 5 5 65.0 2925 5 5 2 63.0 3100 3 3 58.0 3050 4 5 65.2 3400 3 3 3 64.0 1098 5 4 64.0 1125 5 5 64.0 1008 4 4 4 66.0 3162 5 5 63.0 3162 5 5 65.0 3045 5 5 5 67.7 3250 4 2 65.1 2850 4 3 67.2 3200 4 3 6 64.0 2900 5 4 62.0 2950 5 4 65.0 2600 5 5 7 65.0 1225 3 4 63.0 1110 4 3 63.7 1150 3 3 8 72.7 1135 4 5 70.7 1130 3 4 70.0 1073 4 <th></th>													
2 63.0 3100 3 3 58.0 3050 4 5 65.2 3400 3 3 3 64.0 1098 5 4 64.0 1125 5 5 64.0 1008 4 4 4 66.0 3162 5 5 65.0 3045 5 5 5 67.7 3250 4 2 65.1 2850 4 3 67.2 3200 4 3 6 64.0 2900 5 4 62.0 2950 5 4 65.0 2600 5 5 7 65.0 1225 3 4 63.0 1110 4 3 63.7 1150 3 3 8 72.7 1135 4 5 70.7 1130 3 4 70.0 1073 4 3 63.0 825 3 4 65.6 890 3 4 3 9 64.8 1035 3 4 3 65.6													
3 64.0 1098 5 4 64.0 1125 5 5 64.0 1008 4 4 4 66.0 3162 5 5 63.0 3162 5 55 65.0 3045 5 5 5 67.7 3250 4 2 65.1 2850 4 3 67.2 3200 4 3 6 64.0 2900 5 4 62.0 2950 5 4 65.0 2600 5 5 7 65.0 1225 3 4 63.0 1110 4 3 63.7 1150 3 3 8 72.7 1135 4 5 70.7 1130 3 4 70.0 1073 4 3 9 64.8 1035 3 4 63.0 825 3 4 65.6 890 3 4 10 69.1 1128 4 3 65.4 4.2 4.2 65.6 4.0 3.9													
5 67.7 3250 4 2 65.1 2850 4 3 67.2 3200 4 3 6 64.0 2900 5 4 62.0 2950 5 4 65.0 2600 5 5 7 65.0 1225 3 4 63.0 1110 4 3 63.7 1150 3 3 8 72.7 1135 4 5 70.7 1130 3 4 70.0 1073 4 3 9 64.8 1035 3 4 63.0 825 3 4 65.6 890 3 4 10 69.1 1128 4 3 63.4 4.2 4.2 65.6 4.0 3.9		64.0		5	4			5	5		1008	4	4
6 64.0 2900 5 4 62.0 2950 5 4 65.0 2600 5 5 7 65.0 1225 3 4 63.0 1110 4 3 63.7 1150 3 3 8 72.7 1135 4 5 70.7 1130 3 4 70.0 1073 4 3 9 64.8 1035 3 4 65.0 890 3 4 10 69.1 1128 4 3 63.4 4.2 4.2 65.6 4.0 3.9													
7 65.0 1225 3 4 63.0 1110 4 3 63.7 1150 3 3 8 72.7 1135 4 5 70.7 1130 3 4 70.0 1073 4 3 9 64.8 1035 3 4 63.0 825 3 4 65.6 890 3 4 10 69.1 1128 4 3 63.4 4.2 4.2 65.6 890 3 4 Average 65.8 4.1 3.9 63.4 4.2 4.2 65.6 4.0 3.9													
8 72.7 1135 4 5 70.7 1130 3 4 70.0 1073 4 3 9 64.8 1035 3 4 63.0 825 3 4 65.6 890 3 4 10 69.1 1128 4 3 65.4 4.2 4.2 65.6 890 3 4 Average 65.8 4.1 3.9 63.4 4.2 4.2 65.6 4.0 3.9													
9 64.8 1035 3 4 63.0 825 3 4 65.6 890 3 4 10 69.1 1128 4 3													
10 69.1 1128 4 3 Average 65.8 4.1 3.9 63.4 4.2 4.2 65.6 4.0 3.9													
	10	69.1		4	3								
± 1 Sta Dev 3.2 0.9 1.0 3.4 0.8 0.8 1.9 0.9 0.9													
	± 1 Std Dev	3.2		0.9	1.0	3.4		0.8	0.8	1.9		0.9	0.9

						Factors Compared to Glenn Check						
Minot - M1	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &				
Cooperator	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Color	Texture	Protein	Milling	Baking	Overall
1	59.0	2700	94.7	5	4	3	3	5	2	4	2	2
2	60.5	2800	91.8	4	2	2	3	3	2	2	3	2
3	63.0	940	90.6	2	3	2	3	3	2	3	2	2
4	63.0	2927	94.3	4	4	2	2	2	2	3	2	2
5	65.3	3000	93.8	1	4	1	4	5	2	3	3	3
6	63.0	2600	88.1	2	2	2	3	4	2	5	2	3
7	64.0	920	84.4	2	3	1	3	3	2	4	2	2
8	67.2	875	87.5	4	4	2	2	2	2	2	2	2
9	64.1	685	77.4	2	2	2	2	2	2	1	1	1
10	68.0	804	77.8	2	3	1	2	5	2	1	1	1
Average	63.7		88.0	2.8	3.1	1.8	2.7	3.4	2.0	2.8	2.0	2.0
± 1 Std Dev	2.7		6.4	1.3	0.9	0.6	0.7	1.3	0.0	1.3	0.7	0.7
							Fac	tors Comp	ared to Gl	enn Chec	k	
Williston - W1	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &				
Williston - W1 Cooperator	Absorption	Volume	% of CK	Mixing Requirement	Characteristic	Tolerance	Crumb Color		Protein	enn Chec Milling	k Baking	Overall
							Crumb	Grain &				Overall 3
	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Crumb Color	Grain & Texture	Protein	Milling	Baking	
	Absorption 59.0	Volume 2800	% of CK 98.2	Requirement 5	Characteristic 5	Tolerance	Crumb Color 3	Grain & Texture 4	Protein	Milling 4	Baking	3
	Absorption 59.0 57.0	Volume 2800 2700	% of CK 98.2 87.1	Requirement 5 4	Characteristic 5 4	Tolerance	Crumb Color 3 5	Grain & Texture 4 5	Protein 2 1	Milling 4 3	Baking	3 2
	Absorption 59.0 57.0 62.0	Volume 2800 2700 945	% of CK 98.2 87.1 86.1	Requirement 5 4 3	Characteristic 5 4 2	Tolerance	Crumb Color 3 5	Grain & Texture 4 5	Protein 2 1	Milling 4 3	Baking 3 1 1	3 2 2
	Absorption 59.0 57.0 62.0 60.0	Volume 2800 2700 945 3104	% of CK 98.2 87.1 86.1 98.2	Requirement 5 4 3 5	Characteristic 5 4 2 5	Tolerance 3 4 1 3	Crumb Color 3 5 3 4	Grain & Texture 4 5 3 4	Protein 2 1	Milling 4 3 2 4	Baking 3 1 1 2	3 2 2 2
	Absorption 59.0 57.0 62.0 60.0 62.2	Volume 2800 2700 945 3104 3175	% of CK 98.2 87.1 86.1 98.2 97.7	Requirement 5 4 3 5 3	Characteristic 5 4 2 5 3	Tolerance 3 4 1 3	Crumb Color 3 5 3 4	Grain & Texture 4 5 3 4 5	Protein 2 1	Milling 4 3 2 4	Baking 3 1 1 2 3	3 2 2 2
	Absorption 59.0 57.0 62.0 60.0 62.2 60.0	Volume 2800 2700 945 3104 3175 2800	% of CK 98.2 87.1 86.1 98.2 97.7 96.6	Requirement 5 4 3 5 3 3 3	Characteristic 5 4 2 5 3 3 3	Tolerance 3 4 1 3	Crumb Color 3 5 3 4 5 4 5 4	Grain & Texture 4 5 3 4 5 3 3	Protein 2 1	Milling 4 3 2 4	Baking 3 1 1 2 3	3 2 2 2
	Absorption 59.0 57.0 62.0 60.0 62.2 60.0 60.2	Volume 2800 2700 945 3104 3175 2800 950	% of CK 98.2 87.1 86.1 98.2 97.7 96.6 77.6	Requirement 5 4 3 5 3 3 3	Characteristic 5 4 2 5 3 3 3	Tolerance 3 4 1 3	Crumb Color 3 5 3 4 5 4 5 4 3	Grain & Texture 4 5 3 4 5 3 2	Protein 2 1	Milling 4 3 2 4 3 5 4	Baking 3 1 1 2 3	3 2 2 3 5 1
	Absorption 59.0 57.0 62.0 60.0 62.2 60.0 60.2 67.7	Volume 2800 2700 945 3104 3175 2800 950 830	% of CK 98.2 87.1 86.1 98.2 97.7 96.6 77.6 73.1	Requirement 5 4 3 5 3 3 3	Characteristic 5 4 2 5 3 3 3 3 4	Tolerance 3 4 1 3 2 3 1 3	Crumb Color 3 5 3 4 5 4 5 4 3	Grain & Texture 4 5 3 4 5 3 2 2 2	Protein 2 1	Milling 4 3 2 4 3 5 4	Baking 3 1 1 2 3	3 2 2 3 5 1
Cooperator 1 2 3 4 5 6 7 8 9	Absorption 59.0 57.0 62.0 60.0 62.2 60.0 60.2 67.7 61.1	Volume 2800 2700 945 3104 3175 2800 950 830 775	% of CK 98.2 87.1 86.1 98.2 97.7 96.6 77.6 73.1 74.9	Requirement 5 4 3 5 3 3 3 3 4 3 3 4 3	Characteristic 5 4 2 5 3 3 3 3 4 3 3 4 3	Tolerance 3 4 1 3 2 3 1 3 3 2 2	Crumb Color 3 5 3 4 5 4 3 3 3 3	Grain & Texture 4 5 3 4 5 3 2 2 3	Protein 2 1	Milling 4 3 2 4 3 5 4 2 1	Baking 3 1 1 2 3	3 2 2 3 5 1 2 1

	Factors Compared to Glenn Check											
Watertown - B2	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &				
Cooperator	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Color	Texture	Protein	Milling	Baking	Overall
1	60.0	2800	101.8	4	4	3	2	3	3	3	3	3
2	63.5	2750	96.5	2	2	3	2	3	2	3	2	3
3	64.0	982	95.1	4	3	2	3	3	3	3	3	2
4	66.0	3015	99.0	4	4	2	3	3	2	3	3	2
5	68.6	3100	100.8	2	4	2	4	4	2	4	3	3
6	64.0	2700	98.2	3	2	2	3	3	3	3	3	3
7	66.1	1045	101.0	3	3	2	2	3	2	3	2	2
8	67.6	990	94.3	2	4	2	3	5	2	2	4	4
9	66.0	1000	96.6	3	3	3	2	4	3	2	3	3
10	70.2	1000	99.8	1	4	2	3	4	2	2	2	2
Average	65.6		98.3	2.8	3.3	2.3	2.7	3.5	2.4	2.8	2.8	2.7
± 1 Std Dev	2.9		2.6	1.0	0.8	0.5	0.7	0.7	0.5	0.6	0.6	0.7
							Fac	tors Comp	ared to GI	enn Chec	k	
Casselton - C2	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &				
Cooperator	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Color	Texture	Protein	Milling	Baking	Overall
1	59.0	2950	98.3	5	5	3	2	3	3	5	3	3
2	59.0	2850	101.8	4	4	4	2	2	2	1	2	2
3	63.0	973	91.8	3	4	2	3	3	3	2	2	2
4	63.0	2927	97.6	5	5	3	2	3	2	2	2	2
5	64.2	2650	93.8	3	1	3	5	5	2	2	2	2
6	62.0	2700	93.1	3	3	2	3	3	2	5	2	2
7	62.4	1035	101.0	3	3	3	2	4	1	4	3	2
8	68.7	950	93.6	5	3	3	2	4	2	2	4	4
9	62.6	790	82.3	2	2	3	1	3	3	2	1	2
10	66.1	1019	100.9	2	4	3	3	5	2	2	3	2
Average	63.0		95.4	3.5	3.4	2.9	2.5	3.5	2.2	2.7	2.4	2.3
±1 Std Dev	2.9		5.9	1.2	1.3	0.6	1.1	1.0	0.6	1.4	0.8	0.7
							Fac	tors Comp	ared to GI	enn Chec	k	
Minot - M2	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &				
Cooperator	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Color	Texture	Protein	Milling	Baking	Overall
1	60.0	2750	96.5	5	5	3	2	4	3	3	3	3
2	61.0	3000	98.4	3	4	4	5	5	3	3	4	4
3	64.0	1020	98.3	4	3	3	3	3	2	2	3	3
4	65.0	3162	101.9	5	5	3	2	2	2	3	2	2
5	66.3	3150	98.4	1	1	1	4	5	3	3	3	3
6	63.0	2950	100.0	3	3	2	3	3	3	4	3	3
7	64.2	1180	108.3	2	3	2	3	4	3	3	3	3
8	67.9	975	97.5	3	5	1	2	4	3	2	4	4
9	63.7	855	96.6	2	3	2	1	2	3	1	2	2
10	68.0	890	86.1	1	3	2	1	5	3	1	1	2
Average	64.3		98.2	2.9	3.5	2.3	2.6	3.7	2.8	2.5	2.8	2.9
± 1 Std Dev	2.6		5.5	1.4	1.3	0.9	1.3	1.2	0.4	1.0	0.9	0.7

							F	actors Com	pared to Gle	enn Check		
Casselton - C3	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &				
Cooperator	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Color	Texture	Protein	Milling	Baking	Overall
1	59.0	2900	96.7	5	5	3	2	4	3	5	3	3
2	60.0	3000	107.1	4	3	3	3	4	2	3	3	3
3	63.0	985	92.9	3	3	2	3	3	2	4	2	2
4	63.0	2927	97.6	5	5	2	3	2	2	2	2	2
5	64.9	3175	112.4	3	3	3	5	5	2	3	4	4
6	62.0	2700	93.1	3	3	2	3	3	2	5	3	3
7	62.6	990	96.6	2	3	2	2	3	2	4	2	2
8	65.2	975	96.1	3	3	2	3	4	2	3	3	3
9	62.8	820	85.4	2	3	3	1	2	3	3	1	2
10	66.8	1002	99.2	3	3	2	3	3	2	5	2	3
Average	62.9		97.7	3.3	3.4	2.4	2.8	3.3	2.2	3.7	2.5	2.7
±1 Std Dev	2.3		7.5	1.1	0.8	0.5	1.0	0.9	0.4	1.1	0.8	0.7
								actors Com	pared to Gle	enn Check		
Crookston - K3	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &				
Cooperator	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Color	Texture	Protein	Milling	Baking	Overall
1	56.0	2800	96.6	3	2	1	2	5	1	4	1	1
2	61.5	2700	96.4	4	4	2	3	3	1	3	2	2
3	60.0	848	89.3	1	2	1	3	4	2	3	2	1
4	65.0	2986	96.2	2	2	2	2	2	1	3	2	2
5	66.6	2500	86.2	2	4	3	3	4	1	3	1	3
6	63.0	2250	83.3	1	1	1	1	1	1	4	1	1
7	63.9	895	94.2	3	3	1	1	4	1	3	2	1
8	65.3	765	85.0	4	4	2	3	2	2	2	2	2
9	64.4	765	87.4	2	3	2	1	2	1	2	1	1
10	66.7	814	91.6	2	3	1	3	4	1	2	1	1
Average	63.2		90.6	2.4	2.8	1.6	2.2	3.1	1.2	2.9	1.5	1.5
±1 Std Dev	3.3		5.1	1.1	1.0	0.7	0.9	1.3	0.4	0.7	0.5	0.7
								actors Com	pared to Gle	enn Check		
Minot - M3	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &				
	A 1	14-1	A/ O/	B	OI	T - 1					B . I	A A A A
Cooperator	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Color	Texture	Protein	Milling	Baking	Overall
1	60.0	2800	98.2	3	3	2	2	3	3	3	3	3
1 2	60.0 61.5	2800 2950	98.2 96.7	3 4	3 3	2 3	2 4	3 4	3 2	3 4	3 4	3 4
1 2 3	60.0 61.5 63.0	2800 2950 1018	98.2 96.7 98.1	3 4 4	3 3 4	2 3 3	2 4 3	3 4 3	3 2 4	3 4 3	3 4 3	3 4 3
1 2 3 4	60.0 61.5 63.0 65.0	2800 2950 1018 3045	98.2 96.7 98.1 98.1	3 4 4 4	3 3 4 5	2 3 3 2	2 4 3 3	3 4 3 2	3 2 4 2	3 4 3 3	3 4 3 2	3 4 3 2
1 2 3 4 5	60.0 61.5 63.0 65.0 66.4	2800 2950 1018 3045 3125	98.2 96.7 98.1 98.1 97.7	3 4 4 4 2	3 3 4 5 3	2 3 3 2 2	2 4 3 3 5	3 4 3 2 4	3 2 4 2 2	3 4 3 3 3	3 4 3 2 3	3 4 3 2 2
1 2 3 4 5 6	60.0 61.5 63.0 65.0 66.4 63.0	2800 2950 1018 3045 3125 2900	98.2 96.7 98.1 98.1 97.7 98.3	3 4 4 4 2 3	3 3 4 5 3 3	2 3 2 2 2	2 4 3 5 3	3 4 3 2 4 4	3 2 4 2 2 2	3 4 3 3 3 3	3 4 3 2 3 3	3 4 3 2 2 3
1 2 3 4 5 6 7	60.0 61.5 63.0 65.0 66.4 63.0 63.5	2800 2950 1018 3045 3125 2900 1075	98.2 96.7 98.1 98.1 97.7 98.3 98.6	3 4 4 2 3 3	3 3 4 5 3 3 4	2 3 2 2 2 2 2	2 4 3 5 3 3 3	3 4 3 2 4 4 3	3 2 4 2 2 2 2 2	3 4 3 3 3 3 2	3 4 3 2 3 3 2 2	3 4 3 2 2 3 2 2
1 2 3 4 5 6 7 8	60.0 61.5 63.0 65.0 66.4 63.0 63.5 68.3	2800 2950 1018 3045 3125 2900 1075 960	98.2 96.7 98.1 98.1 97.7 98.3 98.6 96.0	3 4 4 2 3 3 3 4	3 3 4 5 3 3 4 4	2 3 2 2 2 2 2 2 2	2 4 3 5 3 3 3 2	3 4 3 2 4 4 3 3	3 2 4 2 2 2 2 2 2 2	3 4 3 3 3 3 2 2 2	3 4 3 2 3 3 2 3 2 3	3 4 3 2 2 3 2 4
1 2 3 4 5 6 7 8 9	60.0 61.5 63.0 65.0 66.4 63.0 63.5 68.3 63.4	2800 2950 1018 3045 3125 2900 1075 960 815	98.2 96.7 98.1 97.7 98.3 98.6 96.0 92.1	3 4 4 2 3 3 4 2	3 3 4 5 3 3 4 4 3	2 3 2 2 2 2 2 2 2 2 2 2 2	2 4 3 5 3 3 2 2	3 4 3 2 4 4 3 3 2	3 2 4 2 2 2 2 2 3	3 4 3 3 3 3 2 2 2 2	3 4 3 2 3 3 2 3 2 3 2	3 4 2 2 3 2 4 2
1 2 3 4 5 6 7 8 9 10	60.0 61.5 63.0 65.0 66.4 63.0 63.5 68.3 63.4 67.4	2800 2950 1018 3045 3125 2900 1075 960	98.2 96.7 98.1 97.7 98.3 98.6 96.0 92.1 90.9	3 4 4 2 3 3 4 2 2	3 3 4 5 3 3 4 4 4 3 3 3	2 3 2 2 2 2 2 2 2 2 3	2 4 3 5 3 3 2 2 2 2	3 4 3 2 4 4 3 3 2 4	3 2 4 2 2 2 2 2 3 2 3 2	3 4 3 3 3 2 2 2 2 2 2	3 4 3 2 3 3 2 3 2 2 2	3 4 3 2 3 2 4 2 2
1 2 3 4 5 6 7 8 9 10 Average	60.0 61.5 63.0 65.0 66.4 63.0 63.5 68.3 63.4 67.4 64.2	2800 2950 1018 3045 3125 2900 1075 960 815	98.2 96.7 98.1 97.7 98.3 98.6 96.0 92.1 90.9 96.5	3 4 4 2 3 3 4 2 2 3.1	3 3 4 5 3 3 4 4 3 3 3.5	2 3 2 2 2 2 2 2 3 2.3	2 4 3 5 3 2 2 2 2 2.9	3 4 3 2 4 4 3 3 2 4 3.2	3 2 4 2 2 2 2 2 3 2 3 2 2.4	3 4 3 3 3 2 2 2 2 2 2 2 2 2 2 2 2	3 4 3 2 3 3 2 3 2 2 2 2.7	3 4 3 2 2 3 2 4 2 2 2.7
1 2 3 4 5 6 7 8 9 10	60.0 61.5 63.0 65.0 66.4 63.0 63.5 68.3 63.4 67.4	2800 2950 1018 3045 3125 2900 1075 960 815	98.2 96.7 98.1 97.7 98.3 98.6 96.0 92.1 90.9	3 4 4 2 3 3 4 2 2	3 3 4 5 3 3 4 4 4 3 3 3	2 3 2 2 2 2 2 2 2 2 3	2 4 3 5 3 2 2 2 2 2.9 1.0	3 4 3 2 4 4 3 3 2 4 3.2 0.8	3 2 4 2 2 2 2 2 3 2 2 3 2 2.4 0.7	3 4 3 3 3 2 2 2 2 2 2 2 2 7 0.7	3 4 3 2 3 3 2 3 2 2 2	3 4 3 2 3 2 4 2 2
1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev	60.0 61.5 63.0 65.0 66.4 63.0 63.5 68.3 63.4 67.4 64.2 2.6	2800 2950 1018 3045 3125 2900 1075 960 815 940	98.2 96.7 98.1 97.7 98.3 98.6 96.0 92.1 90.9 96.5 2.8	3 4 4 2 3 3 4 2 2 3.1 0.9	3 3 4 5 3 3 4 4 3 3 3.5 0.7	2 3 2 2 2 2 2 2 2 3 2.3 0.5	2 4 3 5 3 2 2 2 2.9 1.0	3 4 3 2 4 4 3 2 4 3.2 0.8 actors Com	3 2 4 2 2 2 2 2 3 2 2 3 2 2.4 0.7	3 4 3 3 3 2 2 2 2 2 2 2 2 7 0.7	3 4 3 2 3 3 2 3 2 2 2 2.7	3 4 3 2 2 3 2 4 2 2 2.7
1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W3	60.0 61.5 63.0 65.0 66.4 63.0 63.5 68.3 63.4 67.4 64.2 2.6 Bake	2800 2950 1018 3045 3125 2900 1075 960 815 940 Loaf	98.2 96.7 98.1 97.7 98.3 98.6 96.0 92.1 90.9 96.5 2.8 LV	3 4 4 2 3 3 4 2 2 3.1 0.9 Mixing	3 3 4 5 3 3 4 4 3 3 3.5 0.7 Dough	2 3 2 2 2 2 2 2 2 3 2.3 0.5 Mix	2 4 3 5 3 2 2 2 2 2 2 5 5 5 3 3 2 2 2 2 2 5 5 5 5	3 4 3 2 4 4 3 2 4 3 2 4 3.2 0.8 actors Com Grain &	3 2 4 2 2 2 2 2 3 2 2 3 2 2 4 0.7 pared to Gle	3 4 3 3 3 2 2 2 2 2 2 2 2 2 7 0.7 7 cenck	3 4 3 2 3 3 2 3 2 2 2.7 0.7	3 4 3 2 2 3 2 4 2 2.7 0.8
1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev	60.0 61.5 63.0 65.0 66.4 63.0 63.5 68.3 63.4 67.4 64.2 2.6	2800 2950 1018 3045 3125 2900 1075 960 815 940	98.2 96.7 98.1 97.7 98.3 98.6 96.0 92.1 90.9 96.5 2.8	3 4 4 2 3 3 4 2 2 3.1 0.9	3 3 4 5 3 3 4 4 3 3 3.5 0.7	2 3 2 2 2 2 2 2 2 3 2.3 0.5	2 4 3 5 3 2 2 2 2.9 1.0	3 4 3 2 4 4 3 2 4 3.2 0.8 actors Com	3 2 4 2 2 2 2 2 3 2 2 3 2 2.4 0.7	3 4 3 3 3 2 2 2 2 2 2 2 2 7 0.7	3 4 3 2 3 3 2 3 2 2 2 2.7	3 4 3 2 2 3 2 4 2 2 2.7
1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W3 Cooperator	60.0 61.5 63.0 65.0 66.4 63.0 63.5 68.3 63.4 67.4 64.2 2.6 Bake Absorption	2800 2950 1018 3045 3125 2900 1075 960 815 940 Loaf Volume	98.2 96.7 98.1 97.7 98.3 98.6 96.0 92.1 90.9 96.5 2.8 LV % of CK	3 4 4 2 3 3 4 2 2 3.1 0.9 Mixing Requirement	3 3 4 5 3 3 4 4 4 3 3 3.5 0.7 Dough Characteristic	2 3 2 2 2 2 2 2 2 3 3 2.3 0.5 Mix Tolerance	2 4 3 5 3 2 2 2 2 2 2 2 2 5 5 5 5 5 7 7 8 7 7 7 7 7 7 7 7 7 7 7 7	3 4 3 2 4 3 3 2 4 3.2 0.8 actors Com Grain & Texture	3 2 4 2 2 2 2 3 2 2 3 2 2 4 0.7 pared to Gke	3 4 3 3 2 2 2 2 2 2 2 2.7 0.7 0.7 Check Milling	3 4 3 2 3 3 2 2 2 2.7 0.7 Baking	3 4 3 2 2 3 2 4 2 2 2.7 0.8
1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W3 Cooperator 1	60.0 61.5 63.0 65.0 66.4 63.0 63.5 68.3 63.4 67.4 64.2 2.6 Bake Absorption 60.0	2800 2950 1018 3045 3125 2900 1075 960 815 940 Loaf Volume 2800	98.2 96.7 98.1 97.7 98.3 98.6 96.0 92.1 90.9 96.5 2.8 LV % of CK 98.2	3 4 4 2 3 3 4 2 2 2 3.1 0.9 Mixing Requirement 5	3 3 4 5 3 3 4 4 3 3 3.5 0.7 Dough Characteristic 5	2 3 2 2 2 2 2 2 2 3 3 2.3 0.5 5 Mix Tolerance 3	2 4 3 5 3 2 2 2 2 2 2 5 5 5 5 5 5 5 5 7 2 2 2 2 2	3 4 3 2 4 4 3 3 2 4 3.2 0.8 actors Com Grain & Texture 3	3 2 4 2 2 2 2 2 2 2 2 3 2 2 4 0.7 pared to Gle Protein 3	3 4 3 3 2 2 2 2 2 2.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0	3 4 3 2 3 3 2 2 2.7 0.7 Baking 3	3 4 3 2 2 3 4 2 2 4 2 2 2 0.8 Overall 3
1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W3 Cooperator 1 2	60.0 61.5 63.0 65.0 66.4 63.0 63.5 68.3 63.4 67.4 64.2 2.6 Bake Absorption 60.0 60.5	2800 2950 1018 3045 3125 2900 1075 960 815 940 Loaf Volume 2800 2950	98.2 96.7 98.1 98.1 97.7 98.3 98.6 96.0 92.1 90.9 96.5 2.8 LV % of CK 98.2 95.2	3 4 4 2 3 3 4 2 2 2 3.1 0.9 Mixing Requirement 5 4	3 3 4 5 3 3 4 4 3 3 3.5 0.7 Dough Characteristic 5	2 3 2 2 2 2 2 2 3 0.5 2.3 0.5 2 3 4	2 4 3 5 5 3 2 2 2 2 2 2 2 2 2 9 1.0 FF Color 3 5	3 4 3 2 4 3 3 2 4 3.2 0.8 actors Com, Grain & Texture 3 5	3 2 4 2 2 2 2 2 3 2 2.4 0.7 pared to Gle Protein 3 2	3 4 3 3 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 4 3 2 3 3 2 2 2 2 2,7 0,7 Baking 3 3	3 4 3 2 2 3 2 4 2 2 2 2 2 2 2 3 3 2 4 3 3 3
1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W3 Cooperator 1 2 3 4	60.0 61.5 63.0 65.0 66.4 63.5 68.3 63.4 67.4 64.2 2.6 Bake Absorption 60.0 60.5 64.0 65.0	2800 2950 1018 3045 3125 2900 1075 960 815 940 Loaf Volume 2800 2950 963 3162	98.2 96.7 98.1 98.1 98.3 98.6 96.0 92.1 90.9 96.5 2.8 LV % of CK 98.2 95.2 87.7 100.0	3 4 4 2 3 3 4 2 3.1 0.9 Mixing Requirement 5 4 3	3 3 4 5 3 3 4 4 3 3 3.5 0.7 Dough Characteristic 5 5 3	2 3 2 2 2 2 2 2 2 2 3 3 2.3 0.5 5 Mix Tolerance 3 4 2 3	2 4 3 5 5 3 2 2 2 2 2 2 2 2 1.0 F. Color 3 5 3 4	3 4 3 2 4 3 3 2 4 3 2 4 3.2 0.8 actors Com Grain & Texture 3 5 3 4	3 2 4 2 2 2 2 2 2 2 2 2 3 2 2 4 0.7 pared to Gle 9 7 0 7 9 7 9 1	3 4 3 3 3 2 2 2 2 2 2 2 2 2 2 7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0	3 4 3 2 3 3 2 2 2 2 2 7 0.7 Baking 3 3 2 4	3 4 3 2 2 3 3 2 4 2 2 2 2 7 0.8 Overall 3 3 2 2 3
1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W3 Cooperator 1 2 3 4 5	60.0 61.5 63.0 65.0 66.4 63.0 63.5 68.3 63.4 67.4 64.2 2.6 Bake Absorption 60.0 60.5 64.0 65.0 65.5	2800 2950 1018 3045 3125 2900 1075 960 815 940 Loaf Volume 2800 2950 963	98.2 96.7 98.1 98.1 97.7 98.3 98.6 96.0 92.1 90.9 96.5 2.8 LV % of CK 98.2 95.2 87.7 100.0 92.3	3 4 4 2 3 3 4 2 2 2 3.1 0.9 Mixing Requirement 5 4 3 5	3 3 4 5 3 3 4 4 3 3 3 5 0.7 Dough Characteristic 5 5 3 5	2 3 2 2 2 2 2 2 2 3 3 2.3 0.5 Mix Tolerance 3 4 2	2 4 3 5 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 4 3 2 4 3 3 2 4 3 2 4 3 2 4 3 2 4 3 2 4 5 5	3 2 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 4 3 3 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 4 3 2 3 3 2 2 2 2,7 0,7	3 4 3 2 2 3 2 4 2 2 2 2 2 2 3 3 2 2 3 3 3 3
1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W3 Cooperator 1 2 3 4 5 6	60.0 61.5 63.0 65.0 66.4 63.5 68.3 63.4 67.4 64.2 2.6 Bake Absorption 60.0 60.5 64.0 65.5 63.0	2800 2950 1018 3045 3125 2900 1075 960 815 940 Volume 2800 2950 963 3162 3000 2700	98.2 96.7 98.1 98.1 97.7 98.3 98.6 96.0 92.1 90.9 96.5 2.8 LV % of CK 98.2 95.2 87.7 100.0 92.3 93.1	3 4 4 2 3 3 4 2 2 2 3.1 0.9 Mixing Requirement 5 4 3 5 3	3 3 4 5 3 3 4 4 4 3 3 3.5 0.7 Dough Characteristic 5 3 5 2	2 3 2 2 2 2 2 2 2 3 2.3 0.5 Mix Tolerance 3 4 2 3 2 4	2 4 3 3 5 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 4 3 2 4 3 3 2 4 3.2 0.8 actors Com Grain & 5 3 4 5 3 3	3 2 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 4 3 3 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 4 3 2 3 3 2 2 2,7 0,7	3 4 3 2 2 3 2 4 2 2 2.7 0.8 Overall 3 2 3 3 5
1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W3 Cooperator 1 2 3 4 5 6 7	60.0 61.5 63.0 65.0 66.4 63.5 68.3 63.4 67.4 64.2 2.6 Bake Absorption 60.0 60.5 64.0 65.5 63.0 64.4	2800 2950 1018 3045 3125 2900 1075 960 815 940 Loaf Volume 2800 2950 963 3162 3000 2700 995	98.2 96.7 98.1 97.7 98.3 98.6 96.0 92.1 90.9 96.5 2.8 LV % of CK 98.2 95.2 87.7 100.0 92.3 93.1 81.2	3 4 4 2 3 3 4 2 2 3.1 0.9 Mixing Requirement 5 4 3 5 3 4	3 3 4 5 3 3 4 4 3 3 3.5 0.7 Dough Characteristic 5 5 3 5 2 4	2 3 2 2 2 2 2 2 2 2 3 3 2.3 0.5 Mix Tolerance 3 4 2 3 2 2 4 2 2	2 4 3 3 5 3 3 2 2 2 2 2 2 9 1.0 F. Color 3 5 3 4 4 4 2	3 4 3 2 4 3 3 2 4 3 2 4 3 2 0.8 actors Com Grain & Texture 3 5 3 4 5 3 2 2	3 2 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 4 3 3 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 4 3 2 3 3 2 2 2 2 2 7 0.7 0.7 Baking 3 3 2 4 4 2 2 2	3 4 3 2 2 3 3 2 4 2 2 2 2 7 0.8 Overall 3 3 2 3 3 5 2
1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W3 Cooperator 1 2 3 4 5 6	60.0 61.5 63.0 65.0 66.4 63.5 68.3 63.4 67.4 64.2 2.6 Bake Absorption 60.0 60.5 64.0 65.5 63.0 65.5 63.0 64.4 72.7	2800 2950 1018 3045 3125 2900 1075 960 815 940 Volume 2800 2950 963 3162 3000 2700 995 945	98.2 96.7 98.1 98.1 97.7 98.3 98.6 96.0 92.1 90.9 96.5 2.8 LV % of CK 98.2 95.2 87.7 100.0 92.3 93.1 81.2 83.3	3 4 4 2 3 3 4 2 2 2 3.1 0.9 Mixing Requirement 5 4 3 4 3 4 4	3 3 4 5 3 3 4 4 4 3 3 3 5 0.7 Dough Characteristic 5 5 5 5 2 4 3 4	2 3 2 2 2 2 2 2 2 2 2 2 3 3 0.5 Mix Tolerance 3 4 2 3 2 4 2 3	2 4 3 5 5 3 3 2 2 2 2 2 9 1.0 F Crumb Color 3 5 3 4 4 4 4 2 3	3 4 3 2 4 3 3 2 4 3 2 4 3 2 4 3 5 3 5 3 4 5 3 2 2 2	3 2 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 4 3 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 4 3 2 3 3 2 2 2 2 7 0.7 Baking 3 3 2 4 2 2 2 2 2 2	3 4 3 2 2 3 2 4 2 2 2 2 2 3 3 2 2 3 3 3 5 2 2 2
1 2 3 4 5 6 7 8 9 10 Average ±1 Std Dev Williston - W3 Cooperator 1 2 3 4 5 6 7 8	60.0 61.5 63.0 65.0 66.4 63.0 63.5 68.3 63.4 67.4 64.2 2.6 Bake Absorption 60.0 60.5 64.0 65.5 63.0 65.5 63.0 64.4 72.7 64.2	2800 2950 1018 3045 3125 2900 1075 960 815 940 Loaf Volume 2800 2950 963 3162 3000 2700 995	98.2 96.7 98.1 98.1 97.7 98.3 98.6 96.0 92.1 90.9 96.5 2.8 LV % of CK 98.2 95.2 87.7 100.0 92.3 93.1 81.2 83.3 84.5	3 4 4 2 3 3 4 2 2 2 3.1 0.9 Mixing Requirement 5 4 3 5 5 4 3 4 3 4 2	3 3 4 5 3 3 4 4 3 3 3.5 0.7 Dough Characteristic 5 5 3 5 2 4 3 3	2 3 2 2 2 2 2 2 2 3 0.5 Mix Tolerance 3 4 2 3 2 4 2 3 2 2 4 2 3 2 2 2 2 2 2 2	2 4 3 5 5 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 4 3 2 4 3 3 2 4 3 2 4 3 2 4 5 3 3 4 5 3 3 2 2 3	3 2 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 4 3 3 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 4 3 2 3 3 2 2 2 2 7 0.7	3 4 3 2 2 3 2 4 2 2 2 2 2 0.8 2 2 3 3 5 2 2 2 2 2
1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W3 Cooperator 1 2 3 4 5 6 7 8 9 10 Average 10 10 10 10 10 10 10 10 10 10	60.0 61.5 63.0 65.0 66.4 63.5 68.3 63.4 67.4 64.2 2.6 Bake Absorption 60.0 60.5 64.0 65.5 63.0 65.5 63.0 64.4 72.7	2800 2950 1018 3045 3125 2900 1075 960 815 940 2000 2950 963 3162 3000 2950 963 3162 3000 2700 995 945 875	98.2 96.7 98.1 98.1 97.7 98.3 98.6 96.0 92.1 90.9 96.5 2.8 LV % of CK 98.2 95.2 87.7 100.0 92.3 93.1 81.2 83.3	3 4 4 2 3 3 4 2 2 2 3.1 0.9 Mixing Requirement 5 4 3 4 3 4 4	3 3 4 5 3 3 4 4 4 3 3 3 5 0.7 Dough Characteristic 5 5 5 5 2 4 3 4	2 3 2 2 2 2 2 2 2 2 2 2 3 3 0.5 Mix Tolerance 3 4 2 3 2 4 2 3	2 4 3 5 5 3 3 2 2 2 2 2 9 1.0 F Crumb Color 3 5 3 4 4 4 4 2 3	3 4 3 2 4 3 3 2 4 3 2 4 3 2 4 3 5 3 5 3 4 5 3 2 2 2	3 2 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 4 3 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 4 3 2 3 3 2 2 2 2 7 0.7 Baking 3 3 2 4 2 2 2 2 2 2	3 4 3 2 2 3 2 4 2 2 2 2 2 3 3 2 2 3 3 3 5 2 2 2
1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W3 Cooperator 1 2 3 4 5 6 7 8 9 9	60.0 61.5 63.0 65.0 66.4 63.5 68.3 63.4 67.4 64.2 2.6 Bake Absorption 60.0 60.0 60.5 64.0 65.5 63.0 64.4 72.7 64.2 68.1	2800 2950 1018 3045 3125 2900 1075 960 815 940 2000 2950 963 3162 3000 2950 963 3162 3000 2700 995 945 875	98.2 96.7 98.1 98.1 97.7 98.3 98.6 96.0 92.1 90.9 96.5 2.8 LV % of CK 98.2 95.2 87.7 100.0 92.3 93.1 81.2 83.3 84.5 82.0	3 4 4 2 3 3 4 2 2 3.1 0.9 Mixing Requirement 5 4 3 5 3 4 3 4 3 4 2 2 2	3 3 4 5 3 3 4 4 4 3 3 3.5 0.7 Dough Characteristic 5 5 3 5 2 4 3 4 3 3 3	2 3 2 2 2 2 2 2 2 2 3 2.3 0.5 Mix Tolerance 3 4 2 3 2 4 2 2 3 2 2 2 2 2 2 2 2 2 2 2	2 4 3 5 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 4 3 2 4 3 3 2 4 3.2 0.8 actors Com Grain & 5 3 4 5 3 4 5 3 2 2 2 3 5 5	3 2 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 4 3 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 4 3 2 3 3 2 2 2,7 0,7 2 3 3 2 2 2 2	3 4 3 2 2 3 2 4 2 2 2.7 0.8 Overall 3 3 2 3 3 5 2 2 2 2 2 2 2

							F	actors Com	pared to Gle	enn Check		
Casselton -C4	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &				
Cooperator	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Color	Texture	Protein	Milling	Baking	Overall
1	60.0	3000	100.0	5	5	3	2	2	3	4	3	3
2	61.0	3050	108.9	3	3	4	4	4	3	2	4	4
3	64.0	1040	98.1	4	4	3	3	3	3	3	3	3
4	65.0	3104	103.5	5	5	3	2	3	3	2	3	3
5	66.2	3100	109.7	3	1	3	5	5	3	3	5	4
6	63.0	2750	94.8	3	3	2	3	3	3	4	3	3
7	64.3	990	96.6	2	2	2	2	3	3	3	2	2
8	66.9	985	97.0	3	5	2	2	4	2	2	4	4
9	64.2	825	85.9	2	3	3	1	2	3	2	1	2
10	68.1	1001	99.1	2	4	2	2	3	3	3	2	3
Average	64.3		99.4	3.2	3.5	2.7	2.6	3.2	2.9	2.8	3.0	3.1
± 1 Std Dev	2.5		6.9	1.1	1.4	0.7	1.2	0.9	0.3	0.8	1.2	0.7

Watertown - B5 Bake Lat LV Muking Dough Mark Crumb Finitial A 2 63.0 2250 103.6 4 3 3 4 3 3 4 3 3 3 3 3 3 3 4 3 3 4 3 3 4 3 3 4 3 3 2 3 2 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 4 2 3 3 3 2 2 3 3 2 2 4 2 3 3 2 2 4 3 3 3 3								F	actors Com	pared to Gle	enn Check		
1 66.0 2850 103.6 4 4 3 3 4 3 4 3 3 3 3 66.0 3929 96.0 3 3 2 3 3 3 2 2 3 3 3 2 2 3 3 3 2 2 3 3 3 2 2 3 3 3 2 2 3 3 3 2 2 3 3 3 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 <td>Watertown - B5</td> <td>Bake</td> <td>Loaf</td> <td>LV</td> <td>Mixing</td> <td>Dough</td> <td>Mix</td> <td>Crumb</td> <td>Grain &</td> <td></td> <td></td> <td></td> <td></td>	Watertown - B5	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &				
2 66.0 3320 117.5 3 3 2 4 4 2 3 3 5 3 66.0 3104 101.9 5 5 3 4 2 2 3 2 2 5 68.4 3000 97.4 2 4 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 3 3 2 2 3 3 3 2 4 4 4 3 3 2 2 3 3 3 3 3 2 3 3 3 3 2 3 3 3 2 3 3 3 4 3 3 3 2 3 3 4 3 3 3 2 3 3 3 3 3 3 3 3 3 3 3 3	Cooperator	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Color	Texture	Protein	Milling	Baking	Overall
3 64.0 992 96.0 3 3 2 3 4 2 3 3 2 2 4 66.0 3000 97.6 2 4 2 5 4 3 4 3 3 2 2 3 3 2 3 3 2 2 3 3 2 3 3 2 3 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 3 2 3 3 2 3 3 2 3 3 3 2 3 3 3 2 3 3 3 3 3 3 3	1	60.0	2850	103.6	4	4		3	4	3		3	3
4 66.0 3104 101.9 5 5 3 4 2 3 2 2 3 3 3 3 3 3 2 3 2 3 2 3 3 2 2 3 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 2 2 3 4 2 3 4 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 <t< td=""><td>2</td><td>63.5</td><td>3350</td><td>117.5</td><td>3</td><td>3</td><td></td><td>4</td><td>4</td><td>2</td><td>3</td><td></td><td>5</td></t<>	2	63.5	3350	117.5	3	3		4	4	2	3		5
5 66.4 3000 97.6 2 4 2 5 4 3 4 3 3 7 66.4 1070 103.9 3 3 2 2 3 3 2 2 4 2 2 8 66.0 1010 96.2 3 3 2 3 3 3 3 3 3 3 3 3 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 <	3	64.0	992	96.0						3			
6 64.0 2800 94.5 3 2 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 2 3 3 1 2 2 3 3 3 3 1 1 2 9 65.3 980 97.8 2 4 2 2 5 2 3 3 3 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 <th2< th=""> <th2< th=""> <th2< th=""></th2<></th2<></th2<>						5							
7 65.4 1075 103.9 3 3 2 2 3 2 2 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 <th< td=""><td></td><td>68.4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>		68.4											
8 66.0 1010 96.2 3 4 3 4 5 2 2 4 4 9 65.3 989 97.8 2 4 2 2 5 2 3 2 2 4 0.9 0.8 0.5 0.8 2.4 3.3 3 3 3 3 2 2 2 3 2 2 2 3 2 2 2 3 2 2 3 2 2 3 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 <th< td=""><td>6</td><td>64.0</td><td>2600</td><td>94.5</td><td>3</td><td>2</td><td>2</td><td>3</td><td>3</td><td>2</td><td>3</td><td>2</td><td>2</td></th<>	6	64.0	2600	94.5	3	2	2	3	3	2	3	2	2
9 65.3 985 88.5 2 3 3 3 3 3 3 1 2 Average 65.2 99.6 3.0 3.5 2.4 3.2 2.4 2.2 2.5 2.3 2.2 2.4 2.2 2.5 2.3 2.2 2.4 2.2 2.5 2.4 3.2 2.4 2.2 2.7 5 5.0 0.6 0.6 0.5 0.9 1.0 0.5 0.9 1.0 0.5 0.9 1.0 0.5 0.9 1.0 0.5 0.9 1.0 0.5 0.9 1.0 0.5 0.9 1.0 0.5 0.9 1.0 0.5 0.9 1.0 0.5 0.9 1.0 0.5 0.9 1.0 0.5 0.9 1.0 0.5 0.9 1.0 0.5 0.9 1.0 0.5 0.9 1.0 0.5 0.9 1.0 0.5 0.9 1.0 0.5 0.9 1.0 0.	7	65.4	1075	103.9	3	3	2	2	3	2	4	2	2
10 40:3 96:0 97.8 2 4 2 2 3.6 2 3.6 2.4 3.2 2.7 4.Verage ±150 dev 2.6 5.1 0.9 0.8 0.5 0.5 0.9 1.0 0.5 0.6 0.8 1.1 Casselon - C5 Bake 1 Loat 1 Volums 50.0 260 (C K 300 76 (C K 300 77 (C K K 300 77 (C K K 300 77 (C K K 300 77 (C K K K K K K K K K K K K K K K K K K	8	66.0	1010	96.2	3	4	3	4	5	2	2	4	4
Average e5.2 99.6 3.0 3.5 2.4 3.3 3.6 2.4 3.2 2.4 3.7 *1 Sti Dev 2.6 Eat Loar LV Mixing Dough Dough Mix Crume Factors Compared to Glan Check Compared to Glan Check Cooperator Absorption Volume % of CK Requirement Dough Mix Crume Grun A Cooperator Grun A Cooperator Grun A Cooperator Miling Bake Querality 1 2 61.0 3100 110.7 2 4 3 3 4 2 2 3 2 3 4 2 3 2 3 2 3 2 3 2 3 2 2 3 2 2 3 2 2 3 2 2 3 3 3 3 3 3 3 2 3 2 3 3 3 2 <td>9</td> <td>65.3</td> <td>895</td> <td>86.5</td> <td>2</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>1</td> <td>2</td>	9	65.3	895	86.5	2	3	3	3	3	3	3	1	2
±1 Sti Dev 2.6 8.1 0.9 0.9 0.9 1.0 0.5 0.6 0.8 1.1 Casselion - C5 Cooperator Bake Loaf LV Mixing So (CX) Dough Characteristic Dough Testure Mix Grain & Coin Correst Grain & Coin Grain & Coin Coin Grain & Coin Coin Grain & Coin Coin Grain & Coin Coin Grain & Coin Grain Coin <td>10</td> <td>69.3</td> <td>980</td> <td>97.8</td> <td>2</td> <td>4</td> <td>2</td> <td>2</td> <td>5</td> <td>2</td> <td>3</td> <td>2</td> <td>2</td>	10	69.3	980	97.8	2	4	2	2	5	2	3	2	2
Casselton - CS Bake Loaf LV Mixing Requirement Dough Characteristic Mix Tolerance Color Teture Result Protein Milling Milling Baking Result Overall Result 1 59.0 2850 3 3 2 3 4 2 2 4 3 4 2 2 4 3 2 61.0 3100 110.7 2 4 3 3 4 2 2 4 3 3 4 2 2 4 2 2 4 2 2 4 2 2 4 3 3 3 3 2 3 3 3 3 3 3 2 2 4 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 <	Average	65.2		99.6	3.0	3.5	2.4	3.3	3.6	2.4	3.2	2.4	2.7
Cassellon - C5 Bake Loaf LV Mixing Dough Mix Crumb Grain A - Hilling Baking Overall 2000perator Absorption Volume % of CK Requirement Characteristic Tolerance Color Toterance <	± 1 Std Dev	2.6		8.1	0.9	0.8	0.5	0.9	1.0	0.5	0.6	0.8	1.1
Cassellon - C5 Bake Loaf LV Mixing Dough Mix Crumb Grain A - Hilling Baking Overall 2000perator Absorption Volume % of CK Requirement Characteristic Tolerance Color Toterance <								F	actors Com	pared to Gle	enn Check		
1 99.0 2850 95.0 3 3 2 3 4 3 4 4 4 2 61.0 3100 100.7 2 4 3 3 4 2 2 3 3 4 2 2 3 4 2 2 3 4 2 2 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 2 2 3 3 3 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 <td>Casselton - C5</td> <td>Bake</td> <td>Loaf</td> <td>LV</td> <td>Mixing</td> <td>Dough</td> <td>Mix</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Casselton - C5	Bake	Loaf	LV	Mixing	Dough	Mix						
1 99.0 2850 95.0 3 3 2 3 4 3 4 4 4 2 61.0 3100 100.7 2 4 3 3 4 2 2 3 3 4 2 2 3 4 2 2 3 4 2 2 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 2 2 3 3 3 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 <td>Cooperator</td> <td>Absorption</td> <td>Volume</td> <td>% of CK</td> <td></td> <td></td> <td>Tolerance</td> <td>Color</td> <td>Texture</td> <td>Protein</td> <td>Milling</td> <td>Baking</td> <td>Overall</td>	Cooperator	Absorption	Volume	% of CK			Tolerance	Color	Texture	Protein	Milling	Baking	Overall
2 61.0 3100 110.7 2 4 3 3 4 2 2 3 3 3 63.0 967 92.1 3 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 <td>•</td> <td></td>	•												
3 63.0 976 92.1 3 3 2 3 3 3 4 2 2 4 65.0 2966 995.5 5 5 3 2 3 2 3 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 2 3 2 3 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3						4							3
4 65.0 2986 99.5 5 5 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3 3 4 4 3													
5 65.7 2225 100.0 2 4 2 5 5 2 3 3 3 6 63.0 2000 88.7 2 3 2 3 2 3 2 4 4 2 4 4 2 8 67.1 960 94.8 3 5 2 3 3 2 3 4 2 4 4 2 9 63.3 70 60.2 2 3 3 5 2.3 3 2 2 3 4 4 3 4 9 63.3 70 60.2 3 1 0 2.3 3.3 2.9 2.8 4 10 67.3 99.4 2.6 3.7 2.3 3.1 3.5 2.3 3.3 2.9 2.8 4 10 0.3 0.4 Miting Dough Miting Crumb Miting Crumb Miting Crumb Miting Crumb Miting Color 10.3													
6 63.0 2600 89.7 2 3 2 3 2 2 4 4 2 4 4 2 4 4 2 4 4 2 4 4 2 4 4 2 4 4 2 4 4 2 4 4 2 4 4 2 4 4 2 4 4 2 4 4 2 4 4 2 4 4 2 4 4 2 1 2 1 2 3 2 3 2 3 2 3 2 4 3 3 3 3 3 3 3 2 1 2 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0						-							
7 63.4 1005 98.0 2 3 2 4 4 2 4 4 2 4 4 2 4 4 2 4 4 2 3 4 4 2 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 3 3 3 2 4 4 3 3 3 2 3 3 1 1 0 0 0 10 0.3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 2 3 4 4 4 3 3 4 4 3 3													
8 67.1 960 94.6 3 5 2 3 4 2 3 4 2 3 4 2 3 4 2 3 4 2 3 4 2 3 4 2 3 4 2 3 4 2 3 4 2 3 4 2 3 4 2 3 4 2 3 4 2 3 4 2 3 4 2 3 3 3 3 3 3 2 2 3 4 4 3 3 3 4 2 3 3 3 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 4 3 3 3 4 4 3 3 3 3													
9 63.3 770 80.2 2 3 3 2 2 3 2 1 2 Average 63.6 95.6 2.6 3.7 2.3 3.1 3.5 2.3 3.3 2.9 2.8 ±15td Dev 2.6 7.9 1.0 0.8 0.5 0.9 1.0 0.5 0.8 1.0 0.8 Cooperator Absorption Volume % of CK Requirement Characteristic Tolena Crumb Grain & Texture Protein Miling Baking Overall 1 58.0 2800 96.6 2 3 2 3 4 4 3 2 61.5 2800 101.8 4 3 3 2 3 4 4 3 2 2 3 4 4 2 3 2 2 2 2 2 2 2 2 2 2 2 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td></t<>												-	
10 67.3 994 98.4 2 4 2 3 4 2 4 3 3 Average #1 Std Dev 63.8 95.8 2.6 3.7 2.3 3.1 3.5 2.3 3.3 2.9 2.8 Coopstor Bake Coopstor Loaf LV Mixing 61.5 Mixing Characteristic Dough Characteristic Mix Tolerance Cool Texture Fraint Protein Milling Milling Baking Overall 1 4 65.0 2860 96.2 5 5 3 2 3 4 4 3 2 3 4 4 4 3 2 3 4 4 4 3 3 2 3 4 4 4 3 3 2 3 4 4 4 3 3 2 3 4 4 4 2 3 4 2 3 4 2 3 4 2 3						-			-				
Average ±1 Std Dev 63.8 2.6 95.8 7.9 2.6 1.0 3.7 0.0 2.3 0.0 3.1 0.5 3.5 0.9 2.3 0.9 3.3 0.5 2.9 0.5 2.8 0.0 2.9 0.5 2.8 0.5 2.0 0.5 3.3 0.5 2.9 0.5 2.3 0.5 3.3 0.8 2.9 0.2 2.8 0.5 2.5 0.5 3.3 0.5 2.9 0.5 2.2 0.5 2.3 0.5 2.0 0.5 3.3 0.5 2.9 0.5 2.3 0.5 2.0 0.5 3.3 0.5 2.0 0.5 3.3 0.5 2.0 0.5 3.3 0.5 2.0 0.5 3.3 0.5 2.0 0.5 <td>-</td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td>	-					-						-	
± 1 Std Dev 2.6 7.9 1.0 0.8 0.5 0.9 1.0 0.8 Log 1.0 0.8 Crookston - K5 Bake Loaf LV Mixing Dough Mix Crumb Grain & Factors Compared to Glenn Check Overall 1 61.5 2850 101.8 4 3 2 5 3 4 4 2 3 4 4 2 3 4 4 2 3 4 4 2 3 4 4 2 3 1 4 2 3 1 4 2 3 1 4 2 3 1 4 2 3 1 4 2 3 1 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2<			334								-		-
Crookston / Cooperator Bake Loaf LV Mixing Requirement Dough Characteristic Mix Tolerance Crumb Grumb Fracture Protein Milling Baking Overall 1 58.0 2800 96.6 2 3 2 5 3 4 4 3 2 61.5 2800 96.6 2 3 2 5 3 4 4 3 4 62.0 886 93.3 2 3 2 3 1 4 2 2 3 1 4 2 2 3 1 3 2 3 4 4 2 3 4 4 3 3 2 3 1 3 4 3 3 2 3 1 2 3 1 3 2 4 3 2 4 3 2 2 2 2 2 2 2 2 2<													
Crookston - K5 Bake Loaf LV Mixing Dough Mix Crumb Grain & Facture Protein Milling Baking Overall 1 58.0 2800 96.6 2 3 2 5 3 4 4 2 3 4 4 2 3 4 4 3 2 61.5 2850 101.8 4 3 3 4 4 2 3 4 4 2 3 4 4 2 3 4 4 2 3 2 3 2 3 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 3 4 4 2 3 3 3 3 3 3 3 3 3 3 3 3 3 4 4 3 3 3 2	± 1 Stu Dev	2.0		7.9	1.0	0.0	0.5					1.0	0.0
Cooperator Absorption Volume % of CK Requirement Characteristic Tolerance Color Texture Protein Milling Baking Overall 1 58.0 2800 96.6 2 3 2 2 5 3 4 4 3 2 61.5 2850 101.8 4 3 2 3 3 2 3 4 4 4 3 3 62.0 886 93.3 2 3 3 2 3 3 2 3 3 2 3 3 2 2 3 4 2 2 3 4 2 2 2 2 4 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 2 2 2 2 2 2 2 </td <td>Creeksten KE</td> <td>Baka</td> <td>Loof</td> <td>1.V</td> <td>Mixing</td> <td>Dough</td> <td>Mix</td> <td></td> <td></td> <td>Jared to Gle</td> <td>In Check</td> <td></td> <td></td>	Creeksten KE	Baka	Loof	1.V	Mixing	Dough	Mix			Jared to Gle	In Check		
1 56.0 2800 96.6 2 3 2 2 5 3 4 4 3 2 61.5 2800 101.8 4 3 3 4 4 2 3 4 4 3 62.0 886 93.3 2 3 3 2 3 1 4 2 2 2 2 3 1 4 2 2 2 2 3 1 4 2 2 2 2 3 1 3 2 2 2 2 2 4 3 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2										Protein	Milling	Baking	Overall
2 61.5 2850 101.8 4 3 3 4 4 2 3 4 4 3 62.0 886 93.3 2 3 2 3 3 2 3 2 3 2 2 2 2 2 2 2 2 2 2 2 2 3 1 4 2 2 2 2 3 1 3 3 2 3 1 3 3 1 3 3 2 3 1 3 3 2 3 1 3 3 2 3 1 3 3 2 4 3 2 3 3 1 3 3 2 4 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3											•	•	
3 62.0 886 93.3 2 3 2 3 3 2 3 2 2 2 2 2 3 1 4 2 2 2 3 1 4 2 2 2 3 1 4 2 2 2 3 1 1 3 3 1 3 3 1 4 2 2 3 1 1 3 3 1 4 2 2 3 1 4 2 2 2 1 3 3 3 2 4 3 3 3 2 4 3 3 3 2 4 3 3 3 2 4 3 3 3 2 4 3 3 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2													
4 65.0 2986 96.2 5 5 3 2 3 1 4 2 2 5 66.5 2600 89.7 2 3 3 4 5 2 3 1 4 2 2 7 63.6 845 88.9 3 4 3 3 3 2 2 4 3 2 8 69.8 845 93.9 4 4 2 3 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 </td <td></td>													
5 66.5 2600 89.7 2 3 3 4 5 2 3 1 3 6 63.0 2750 101.9 2 3 2 2 2 2 2 4 2 2 7 63.6 845 89.9 3 4 3 3 3 2 2 2 4 2 2 8 69.8 845 93.9 4 4 2 3 4 2 2 2 2 2 4 2 9 64.2 725 82.9 2 3 3 1 2 2 2 2 2 2 2 2 4 1 2 Average 64.1 772 86.8 2 4 3 3 4 2 2.0 3.3 2.3 2.5 5 2.0 3.3 2.3 2.6 5 5 1.1 0.5 0.8 1.1 0.8 7 2.0 3.3 3 3 <													
6 63.0 2750 101.9 2 3 2 2 2 2 4 2 2 7 63.6 845 88.9 3 4 3 3 3 2 4 3 2 8 69.8 845 93.9 4 4 2 3 4 2 2 2 4 3 2 9 64.2 725 82.9 2 3 3 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td>										-			
7 63.6 845 88.9 3 4 3 3 3 2 4 3 2 8 69.8 845 93.9 4 4 2 3 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 3 3 2 2 2 3 3 3 3 3 2 2 2													
8 69.8 845 93.9 4 4 2 3 4 2 2 2 2 4 9 64.2 725 82.9 2 3 3 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 0 0 5 0 3 3 4 3 3 2 3 3 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3						•							
9 64.2 725 82.9 2 3 3 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 3 3 4 2 3 3 3 3 3 3 3 3 3 3 3 2 2 3 3 3 3 3 3 3 3 3 3 3 3	-					-							
10 67.4 772 86.8 2 4 3 3 4 2 4 1 2 Average 64.1 93.2 2.8 3.5 2.6 2.7 3.5 2.0 3.3 2.3 2.6 ±1 Std Dev 3.3 6.2 1.1 0.7 0.5 0.9 1.1 0.5 0.8 1.1 0.8 Minot - M5 Bake Loaf LV Mixing Dough Mix Crumb Grain & Crumb Grain & Overall						•							
Average ±1 Std Dev 64.1 93.2 2.8 3.5 2.6 2.7 3.5 2.0 3.3 2.3 2.6 ±1 Std Dev 3.3 6.2 1.1 0.7 0.5 0.9 1.1 0.5 0.8 1.1 0.8 Minot - M5 Cooperator Bake Absorption Loaf Volume LV Mixing % of CK Dough Requirement Mix Crumb Characteristic Grain & Color Color Texture Protein Milling Baking Overall 1 60.0 2750 96.5 5 5 3 3 4 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 <													
± 1 Std Dev 3.3 6.2 1.1 0.7 0.5 0.9 1.1 0.5 0.8 1.1 0.8 Minot - M5 Bake Loaf LV Mixing Dough Mix Crumb Grain & Factors Compared to Glenn Check Overall 1 60.0 2750 96.5 5 5 3 3 4 3 3 3 3 2 59.5 3050 100.0 2 3 2 5 5 3 3 4 3 3 5 4 3 64.0 966 93.1 3 3 1 3 3 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 <td></td> <td></td> <td>//2</td> <td></td>			//2										
Mino t - M5 Cooperator Bake Absorption Lof Volume % of CK LV Requirement % of CK Mough Requirement Characteristic Mix Tolerance Tolerance Crumb Color Grain & Texture Golor Protein Million Bake Baking Overall 1 60.0 2750 96.5 5 5 3 4 3 3 3 3 2 59.5 3050 100.0 2 3 2 5 5 3 3 5 4 3 64.0 966 93.1 3 3 1 3 3 2 4 2 2 4 63.0 3104 100.0 5 5 3 4 2 3 3 3 3 5 65.0 3150 98.4 1 3 1 4 4 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 <td></td>													
Minot - M5 Bake Loaf LV Mixing Dough Mix Crumb Grain & Cooperator Absorption Volume % of CK Requirement Characteristic Tolerance Color Texture Protein Milling Baking Overall 1 60.0 2750 96.5 5 5 3 3 4 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 </td <td>± 1 Std Dev</td> <td>3.3</td> <td></td> <td>6.2</td> <td>1.1</td> <td>0.7</td> <td>0.5</td> <td></td> <td></td> <td></td> <td></td> <td>1.1</td> <td>0.8</td>	± 1 Std Dev	3.3		6.2	1.1	0.7	0.5					1.1	0.8
Cooperator Absorption Volume % of CK Requirement Characteristic Tolerance Color Texture Protein Milling Baking Overall 1 60.0 2750 96.5 5 5 3 3 4 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3<	Min e4 MF	Dala	1 (1.17	Missinger	Dauah				pared to Gle	Inn Check		
1 60.0 2750 96.5 5 5 3 3 4 3 3 3 3 2 59.5 3050 100.0 2 3 2 5 5 3 3 5 4 3 64.0 966 93.1 3 3 1 3 3 2 2 3 2 2 3 3 5 4 4 63.0 3104 100.0 5 5 3 4 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3												B .(1)	•
2 59.5 3050 100.0 2 3 2 5 5 3 3 5 4 3 64.0 966 93.1 3 3 1 3 3 2 4 2 2 4 63.0 3104 100.0 5 3 4 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	•												
3 64.0 966 93.1 3 3 1 3 3 2 4 2 2 4 63.0 3104 100.0 5 5 3 4 2 3 3 3 3 3 5 65.0 3150 98.4 1 3 1 4 4 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3										-			-
4 63.0 3104 100.0 5 5 3 4 2 3 3 3 3 5 65.0 3150 98.4 1 3 1 4 4 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 <td></td>													
5 65.0 3150 98.4 1 3 1 4 4 3 3 3 3 6 62.0 2900 98.3 2 2 2 3 4 3 4 3 3 3 3 7 62.8 1000 91.7 2 3 1 1 3 3 3 2 2 8 68.4 930 93.0 3 4 2 2 3 2 3 4 4 9 62.7 760 85.9 2 2 2 3 2 3 2 1 2 10 66.8 854 82.6 2 3 1 2 5 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 3 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>													
6 62.0 2900 98.3 2 2 2 3 4 3 4 3 3 7 62.8 1000 91.7 2 3 1 3 3 3 2 2 8 68.4 930 93.0 3 4 2 2 3 2 3 4 4 9 62.7 760 85.9 2 2 2 3 2 3 4 4 10 66.8 854 82.6 2 3 1 2 5 3 2 2 2 Average 63.4 94.0 2.7 3.3 1.8 3.2 3.5 2.8 3.0 2.8 2.8													
7 62.8 1000 91.7 2 3 1 3 3 3 2 2 8 68.4 930 93.0 3 4 2 2 3 2 3 4 4 9 62.7 760 85.9 2 2 2 3 2 1 2 10 66.8 854 82.6 2 3 1 2 5 3 2 2 2 Average 63.4 94.0 2.7 3.3 1.8 3.2 3.5 2.8 3.0 2.8 2.8													
8 68.4 930 93.0 3 4 2 2 3 2 3 4 4 9 62.7 760 85.9 2 2 2 3 2 3 2 1 2 10 66.8 85.4 82.6 2 3 1 2 5 3 2 2 2 Average 63.4 94.0 2.7 3.3 1.8 3.2 3.5 2.8 3.0 2.8 2.8									-	-			
9 62.7 760 85.9 2 2 2 3 2 3 2 1 2 10 66.8 854 82.6 2 3 1 2 5 3 2 2 2 Average 63.4 94.0 2.7 3.3 1.8 3.2 3.5 2.8 3.0 2.8 2.8		62.8				3				•			
10 66.8 854 82.6 2 3 1 2 5 3 2 2 2 Average 63.4 94.0 2.7 3.3 1.8 3.2 3.5 2.8 3.0 2.8 2.8									-			-	-
Average 63.4 94.0 2.7 3.3 1.8 3.2 3.5 2.8 3.0 2.8 2.8	-	62.7	760		2	2	2			3		1	
	10	66.8	854	82.6	2	3	1	2	5	3	2	2	2
±1 Std Dev 2.8 6.0 1.3 1.1 0.8 0.9 1.1 0.4 0.7 1.1 0.8		00.0											
	Average	63.4											

						Factors Compared to Glenn Check						
Minot - M6	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &				
Cooperator	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Color	Texture	Protein	Milling	Baking	Overall
1	58.0	2700	94.7	2	2	1	2	4	2	3	2	2
2	57.0	2700	88.5	4	2	4	4	3	1	2	3	3
3	61.0	922	88.8	2	2	2	3	3	2	2	2	2
4	60.0	2809	90.5	3	3	1	1	1	1	2	1	1
5	62.0	3200	100.0	1	4	1	4	3	1	3	3	2
6	60.0	2800	94.9	2	3	2	3	4	1	3	3	3
7	59.8	975	89.4	3	3	2	3	2	1	4	2	2
8	63.1	885	88.5	3	3	2	3	2	2	2	2	2
9	60.3	665	75.1	2	2	2	1	2	1	1	1	1
10	63.8	874	84.5	2	3	2	2	5	1	1	1	1
Average	60.5		89.5	2.4	2.7	1.9	2.6	2.9	1.3	2.3	2.0	1.9
±1 Std Dev	2.1		6.7	0.8	0.7	0.9	1.1	1.2	0.5	0.9	0.8	0.7
						Factors Compared to Glenn Check						
Williston - W6	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &				
Cooperator	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Color	Texture	Protein	Milling	Baking	Overal
1	58.0	2800	98.2	5	5	3	2	3	2	3	3	3
2	55.0	2400	77.4	2	2	2	5	4	1	3	1	1
3	61.0	988	90.0	4	4	2	3	3	4	2	2	2
4	59.0	3015	95.4	5	5	3	3	3	1	3	2	2
5	59.9	3225	99.2	4	4	3	4	5	1	3	3	3
6	58.0	2800	96.6	5	4	4	3	3	1	3	3	4
7	58.3	900	73.5	4	4	4	3	2	1	3	2	2
8	71.7	860	75.8	5	2	4	2	2	2	2	2	2
9	59.1	800	77.3	3	2	2	3	3	1	1	1	1
10	62.2	883	78.3	5	2	3	4	5	1	1	1	1
Average	60.2		86.2	4.2	3.4	3.0	3.2	3.3	1.5	2.4	2.0	2.1
± 1 Std Dev	4.5		10.6	1.0	1.3	0.8	0.9	1.1	1.0	0.8	0.8	1.0

							Fac	tors Comp	ared to GI	enn Chec	k	
Casselton - C7	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &				
Cooperator	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Color	Texture	Protein	Milling	Baking	Overall
1	60.0	2900	96.7	2	2	2	3	4	3	3	2	2
2	62.5	3000	107.1	3	3	2	4	3	3	3	4	3
3	64.0	975	92.0	3	4	2	3	3	2	3	2	2
4	66.0	3044	101.5	5	5	3	3	3	3	3	3	3
5	67.7	2700	95.6	3	3	3	5	5	3	3	2	2
6	64.0	2600	89.7	3	3	2	3	3	3	3	3	3
7	65.5	1000	97.6	3	2	2	4	4	3	3	4	3
8	68.1	975	96.1	3	4	2	3	4	2	3	4	4
9	65.6	755	78.6	2	2	3	2	2	3	3	1	2
10	69.4	1027	101.7	2	4	2	3	4	3	2	3	3
Average	65.3		95.6	2.9	3.2	2.3	3.3	3.5	2.8	2.9	2.8	2.7
± 1 Std Dev	2.8		7.8	0.9	1.0	0.5	0.8	0.8	0.4	0.3	1.0	0.7
							Fac	tors Comp	ared to GI	enn Chec	k	
Crookston - K7	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &				
Cooperator	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Color	Texture	Protein	Milling	Baking	Overall
.1	59.0	2800	96.6	2	3	2	3	4	3	4	4	3
2	65.0	2750	98.2	2	2	4	4	3	3	3	3	3
3	63.0	905	95.3	2	3	2	3	3	2	3	2	2
4	66.0	2883	92.9	4	4	2	3	2	2	4	2	2
5	70.3	2900	100.0	2	1	3	5	5	3	3	3	4
6	65.0	2550	94.4	1	2	2	2	2	3	3	2	2
7	67.6	810	85.3	3	3	2	3	3	3	2	2	2
8	69.3	900	100.0	3	4	2	2	4	2	2	2	4
9	67.3	705	80.6	1	2	3	2	2	3	2	2	2
10	71.6	812	91.3	1	3	2	3	3	3	2	1	2
Average	66.4		93.5	2.1	2.7	2.4	3.0	3.1	2.7	2.8	2.3	2.6
± 1 Std Dev	3.7		6.3	1.0	0.9	0.7	0.9	1.0	0.5	0.8	0.8	0.8
								tors Comp				
Williston - W7	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &				
Cooperator	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Color	Texture	Protein	Milling	Baking	Overall
1	60.0	2900	101.8	5	5	3	3	3	3	3	3	3
2	62.5	2850	91.9	3	4	2	5	4	2	3	2	3
3	64.0	973.0	88.6	4	3	2	3	3	4	1	2	2
4	66.0	3104	98.2	5	5	3	3	4	2	3	3	3
5	67.7	3150	96.9	3	3	2	4	4	2	3	3	3
6	64.0	2900	100.0	3	3	3	4	2	2	3	3	4
7	65.4	1060	86.5	3	3	1	4	2	1	2	2	2
8	70.7	975	85.9	4	4	2	3	2	2	2	2	2
9	64.9	845	81.6	2	4	2	3	3	2	2	1	2
10	69.5	868	77.0	2	4	2	3	4	2	1	1	1
Average	65.5	000	90.8	3.4	3.8	2.2	3.5	3.1	2.2	2.3	2.2	2.5
± 1 Std Dev	3.2		8.3	1.1	0.8	0.6	0.7	0.9	0.8	0.8	0.8	0.8
1 JU DEV	3.2		0.5		0.0	0.0	0.7	0.3	0.0	0.0	0.0	0.0

							Fac	tors Comp	ared to GI	enn Chec	k	
Watertown - B8	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &				
Cooperator	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Color	Texture	Protein	Milling	Baking	Overall
1	61.0	2700	98.2	1	1	1	1	1	3	4	1	1
2	60.5	3300	115.8	2	4	4	4	3	2	2	3	4
3	64.0	890	86.2	1	1	1	3	2	2	2	1	1
4	63.0	2603	85.5	1	1	1	1	1	2	2	1	1
5	65.9	3125	101.6	2	1	2	4	3	2	3	3	3
6	63.0	2700	98.2	2	1	2	3	3	3	4	3	3
7	63.2	960	92.8	2	1	1	2	3	2	4	1	2
8	63.4	935	89.0	2	2	2	3	4	2	2	2	2
9	62.7	850	82.1	2	2	2	2	3	3	2	1	2
10	67.0	962	96.0	1	3	1	2	4	2	2	1	2
Average	63.4		94.5	1.6	1.7	1.7	2.5	2.7	2.3	2.7	1.7	2.1
± 1 Std Dev	2.0		9.8	0.5	1.1	0.9	1.1	1.1	0.5	0.9	0.9	1.0

							Fac	tors Comp	pared to GI	enn Chec	k	
Watertown - B10	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &				
Cooperator	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Color	Texture	Protein	Milling	Baking	Overall
1	61.0	2850	103.6	3	3	2	3	3	3	3	2	2
2	66.0	3050	107.0	4	4	4	3	2	2	3	2	4
3	64.0	995	96.3	5 5	3 5	3 3	3 3	4	4	3	3 2	3
4 5	66.0 70.9	3162 2975	103.8 96.7	э 3	5 2	3	3 3	2 3	2	3 3	2	2 3
6	64.0	2975	96.7	з 3	2	2	3 3	3	2	3 3	3 3	3
6 7	68.3	1115	94.5 107.7	3	2 3	2	2	2	2	3	2	2
8	70.0	995	94.8	3	3	2	2	2	2	2	2	2
9	68.2	820	94.0 79.2	2	3	3	2	3 4	2	2	3 1	2
9 10	72.1	925	92.3	2	3	2	2	5	2	2	2	2
Average	67.1	925	92.5	3.3	3.1	2.7	2.7	3.1	2.5	2.8	2.3	2.6
± 1 Std Dev	3.5		8.5	1.1	0.9	0.7	0.5	1.0	0.7	0.4	0.7	0.7
1 TOTA DOV	0.0		0.5		0.5	0.7		tors Comp				0.7
Casselton - C10	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &		enn oneo	n	
Cooperator	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Color	Texture	Protein	Milling	Baking	Overall
1	60.0	2800	93.3	5	5	3	3	5	3	3	3	3
2	60.0	2650	94.6	3	4	2	2	2	3	3	1	2
3	64.0	992	93.6	3	4	2	3	3	2	3	2	2
4	63.0	3044	101.5	5	5	2	2	3	3	3	2	2
5	65.1	3000	106.2	4	4	4	5	4	3	3	4	4
6	62.0	2650	91.4	3	3	2	3	3	3	3	4	4
7	62.5	1000	97.6	3	2	3	3	5	3	3	3	2
8	68.5	985	97.0	4	3	3	4	4	2	3	4	4
9	62.7	915	95.3	2	3	3	2	3	3	3	3	3
10	66.6	936	92.7	3	4	3	2	4	3	3	2	2
Average	63.4		96.3	3.5	3.7	2.7	2.9	3.6	2.8	3.0	2.8	2.8
± 1 Std Dev	2.7		4.5	1.0	0.9	0.7	1.0	1.0	0.4	0.0	1.0	0.9
							Fac	tors Comp	pared to GI	enn Chec	k	
Crookston - K10	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &				<u> </u>
Cooperator	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Crumb Color	Grain & Texture	Protein	Milling	Baking	Overall
Cooperator 1	Absorption 59.0	Volume 2750	% of CK 94.8	Requirement 3	Characteristic 3	Tolerance 2	Crumb Color 3	Grain & Texture 3	Protein 3	Milling 4	Baking 4	2
Cooperator 1 2	Absorption 59.0 62.0	Volume 2750 2750	% of CK 94.8 98.2	Requirement 3 3	Characteristic 3 3	Tolerance 2 4	Crumb Color 3 2	Grain & Texture 3 2	Protein 3 3	Milling 4 3	Baking 4 3	2 3
Cooperator 1 2 3	Absorption 59.0 62.0 63.0	Volume 2750 2750 932	% of CK 94.8 98.2 98.1	Requirement 3 3 3	Characteristic 3 3 3	Tolerance 2 4 3	Crumb Color 3 2 3	Grain & Texture 3 2 3	Protein 3 3 3	Milling 4 3 2	Baking 4 3 3	2 3 3
Cooperator 1 2 3 4	Absorption 59.0 62.0 63.0 65.0	Volume 2750 2750 932 3104	% of CK 94.8 98.2 98.1 100.0	Requirement 3 3 3 5	Characteristic 3 3 3 5	Tolerance 2 4 3 3	Crumb Color 3 2 3 2 2	Grain & Texture 3 2 3 2 2	Protein 3 3 3 2	Milling 4 3 2 4	Baking 4 3 3 3	2 3 3 3
Cooperator 1 2 3 4 5	Absorption 59.0 62.0 63.0 65.0 67.2	Volume 2750 2750 932 3104 2950	% of CK 94.8 98.2 98.1 100.0 101.7	Requirement 3 3 3 5 3	Characteristic 3 3 3 5 1	Tolerance 2 4 3 3 4	Crumb Color 3 2 3 2 4	Grain & Texture 3 2 3 2 4	Protein 3 3 2 3	Milling 4 3 2 4 3	Baking 4 3 3 3 3	2 3 3 3 4
Cooperator 1 2 3 4 5 6	Absorption 59.0 62.0 63.0 65.0 67.2 64.0	Volume 2750 2750 932 3104 2950 2325	% of CK 94.8 98.2 98.1 100.0 101.7 86.1	Requirement 3 3 3 5 3 3 3	Characteristic 3 3 3 5 1 3	Tolerance 2 4 3 3 4 4 4	Crumb Color 3 2 3 2 4 3	Grain & Texture 3 2 3 2 4 2 4 2	Protein 3 3 2 3 3 3 3	Milling 4 3 2 4 3 4	Baking 4 3 3 3 3 1	2 3 3 3 4 1
Cooperator 1 2 3 4 5 6 7	Absorption 59.0 62.0 63.0 65.0 67.2 64.0 64.9	Volume 2750 2750 932 3104 2950 2325 840	% of CK 94.8 98.2 98.1 100.0 101.7 86.1 88.4	Requirement 3 3 5 5 3 3 3 3 3	Characteristic 3 3 5 1 3 3 3	Tolerance 2 4 3 4 4 4 5	Crumb Color 3 2 3 2 4 3 2 4 3 2	Grain & Texture 3 2 3 2 4 2 4 2 2	Protein 3 3 2 3 3 3 3 3	Milling 4 3 2 4 3 4 4 4	Baking 4 3 3 3 3 1 2	2 3 3 4 1 3
Cooperator 1 2 3 4 5 6 7 8	Absorption 59.0 62.0 63.0 65.0 67.2 64.0 64.9 72.3	Volume 2750 2750 932 3104 2950 2325 840 900	% of CK 94.8 98.2 98.1 100.0 101.7 86.1 88.4 100.0	Requirement 3 3 3 5 3 3 3 3 4	Characteristic 3 3 5 1 3 3 4	Tolerance 2 4 3 4 4 5 3	Crumb Color 3 2 3 2 4 3 2 4 3 2 3	Grain & Texture 3 2 3 2 4 2 2 2 2	Protein 3 3 2 3 3 3 3 4	Milling 4 3 2 4 3 4 4 4 4	Baking 4 3 3 3 3 1 2 4	2 3 3 4 1 3 3
Cooperator 1 2 3 4 5 6 7 8 9	Absorption 59.0 62.0 63.0 65.0 67.2 64.0 64.9 72.3 64.9	Volume 2750 2750 932 3104 2950 2325 840 900 785	% of CK 94.8 98.2 98.1 100.0 101.7 86.1 88.4 100.0 89.7	Requirement 3 3 5 3 3 3 4 2	Characteristic 3 3 5 1 3 3 3 4 3 3	Tolerance 2 4 3 4 5 3 3	Crumb Color 3 2 3 2 4 3 2 3 2 3 2	Grain & Texture 3 2 3 2 4 2 2 2 2 2 2	Protein 3 3 2 3 3 3 3 4 3	Milling 4 3 2 4 3 4 4 4 3	Baking 4 3 3 3 1 2 4 2	2 3 3 4 1 3 3 3 3
Cooperator 1 2 3 4 5 6 7 7 8 9 10	Absorption 59.0 62.0 65.0 67.2 64.0 64.9 72.3 64.9 68.8	Volume 2750 2750 932 3104 2950 2325 840 900	% of CK 94.8 98.2 98.1 100.0 101.7 86.1 88.4 100.0 89.7 99.9	Requirement 3 3 5 3 3 3 3 4 2 3	Characteristic 3 3 5 1 3 3 4 3 4 3 4 3 4	Z 4 3 4 5 3 4	Crumb Color 3 2 3 2 4 3 2 3 2 3 2 3	Grain & Texture 3 2 3 2 4 2 2 2 2 2 3	Protein 3 3 2 3 3 3 3 4 3 3 3 3 3	Milling 4 3 2 4 3 4 4 4 3 4 3 4	Baking 4 3 3 3 1 2 4 2 3	2 3 3 4 1 3 3 3 3 3
Cooperator 1 2 3 4 5 6 7 8 9 10 Average	Absorption 59.0 62.0 65.0 65.0 67.2 64.0 64.9 72.3 64.9 68.8 65.1	Volume 2750 2750 932 3104 2950 2325 840 900 785	% of CK 94.8 98.2 98.1 100.0 101.7 86.1 88.4 100.0 89.7 99.9 95.7	Requirement 3 3 5 5 3 3 4 2 3 3.2	Characteristic 3 3 5 1 3 3 4 3 4 3 4 3 4 3.2	Tolerance 2 4 3 4 5 3 4 5 3 4 5 3 4 5 3 4 5 3 4 5 3 4 3.5	Crumb Color 3 2 3 2 4 3 2 3 2 3 2 3 2.7	Grain & Texture 3 2 3 2 4 2 2 2 2 2 2 3 2.5	Protein 3 3 2 3 3 3 4 3 3 3.0	Milling 4 3 4 3 4 4 4 4 3 4 3.5	Baking 4 3 3 3 1 2 4 2 4 2 3 2.8	2 3 3 4 1 3 3 3 3 2.8
Cooperator 1 2 3 4 5 6 7 7 8 9 10	Absorption 59.0 62.0 65.0 67.2 64.0 64.9 72.3 64.9 68.8	Volume 2750 2750 932 3104 2950 2325 840 900 785	% of CK 94.8 98.2 98.1 100.0 101.7 86.1 88.4 100.0 89.7 99.9	Requirement 3 3 5 3 3 3 3 4 2 3	Characteristic 3 3 5 1 3 3 4 3 4 3 4 3 4	Z 4 3 4 5 3 4	Crumb Color 3 2 3 2 4 3 2 4 3 2 3 2 3 2 2 3 2 2 7 0.7	Grain & Texture 3 2 3 2 4 2 2 2 2 2 3 2.5 0.7	Protein 3 3 2 3 3 4 3 3 3 4 3 3 0 0.5	Milling 4 3 2 4 3 4 4 4 4 3 3 4 4 3.5 0.7	Baking 4 3 3 3 1 2 4 2 3 2.8 0.9	2 3 3 4 1 3 3 3 3 3
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev	Absorption 59.0 62.0 63.0 65.0 67.2 64.0 64.9 72.3 64.9 68.8 65.1 3.7	Volume 2750 2750 932 3104 2950 2325 840 900 785 888	% of CK 94.8 98.2 98.1 100.0 101.7 86.1 88.4 100.0 89.7 99.9 95.7 5.6	Requirement 3 3 3 5 3 3 4 2 3 3.2 0.8	Characteristic 3 3 5 1 3 4 3 4 3 4 3.2 1.0	Tolerance 2 4 3 4 5 3 4 5 3 4 5 3 4 5 3 4 5 3 4 3.5 0.8	Crumb Color 3 2 3 2 4 3 2 3 2 2 3 2 2,7 0,7 Fac	Grain & Texture 3 2 3 2 4 2 2 2 2 2 3 2 2 3 2 5 0.7 tors Comp	Protein 3 3 2 3 3 4 3 3 3 4 3 3 0 0.5	Milling 4 3 2 4 3 4 4 4 4 3 3 4 4 3.5 0.7	Baking 4 3 3 3 1 2 4 2 3 2.8 0.9	2 3 3 4 1 3 3 3 3 2.8
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Minot - M10	Absorption 59.0 62.0 65.0 67.2 64.0 64.9 72.3 64.9 68.8 65.1 3.7 Bake	Volume 2750 932 3104 2950 2325 840 900 785 888	% of CK 94.8 98.2 98.1 100.0 101.7 86.1 88.4 100.0 89.7 99.9 95.7 5.6 LV	Requirement 3 3 3 5 3 3 3 4 2 3 4 2 3 3.2 0.8 Mixing	Characteristic 3 3 5 1 3 4 3 4 3 4 3.2 1.0 Dough	Tolerance 2 4 3 4 5 3 4 5 0.8	Crumb Color 3 2 3 2 4 3 2 2 3 2 2 3 2 2,7 0,7 Fac Crumb	Grain & Texture 3 2 3 2 4 2 2 2 2 2 3 2.5 0.7 tors Comp Grain &	Protein 3 2 3 3 4 3 3 4 3 0.5 bared to Gl	Milling 4 3 2 4 3 4 4 4 3 4 3.5 0.7 0.7 cenn Chec	Baking 4 3 3 3 3 1 2 4 2 3 4 2 3 0.9 k	2 3 3 4 1 3 3 3 2.8 0.8
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Minot - M10 Cooperator	Absorption 59.0 62.0 65.0 67.2 64.0 64.9 72.3 64.9 68.8 65.1 3.7 Bake Absorption	Volume 2750 2750 3104 2950 2325 840 900 785 888 Volume	% of CK 94.8 98.2 98.1 100.0 101.7 86.1 88.4 100.0 89.7 99.9 95.7 5.6 LV % of CK	Requirement 3 3 3 3 3 3 3 3 4 2 3 3.2 0.8 Mixing Requirement	Characteristic 3 3 5 1 3 4 3 4 3 4 3.2 1.0	Tolerance 2 4 3 4 5 3 4 5 0.8 Mix Tolerance	Crumb Color 3 2 3 2 4 3 2 2 3 2 2 3 2 2 3 2 2 7 0.7 Fac Color	Grain & Texture 3 2 3 2 4 2 2 2 2 2 3 2 2 3 2 5 0.7 tors Comp	Protein 3 3 2 3 3 4 3 3 4 3 3 0 0 0 5 0 0 0 1 0 1 0 1 0 1 0 1 0 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1	Milling 4 3 4 4 3 4 4 3 4 4 3.5 0.7 enn Chec Milling	Baking 4 3 3 3 1 2 4 2 3 2.8 0.9 k Baking	2 3 4 1 3 3 3 3 2.8 0.8 Overall
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Minot - M10 Cooperator 1	Absorption 59.0 62.0 65.0 65.0 67.2 64.9 64.9 68.8 65.1 3.7 Bake Absorption 60.0	Volume 2750 2750 3104 2950 2325 840 900 785 888 888	% of CK 94.8 98.2 98.1 100.0 101.7 86.1 88.4 100.0 89.7 99.9 95.7 5.6 LV % of CK 96.5	Requirement 3 3 5 3 3 4 2 3 3.2 0.8 Mixing Requirement 3	Characteristic 3 3 5 1 3 4 3 4 3 4 3.2 1.0 Dough Characteristic	Tolerance 2 4 3 4 5 3 4 5 0.8 Mix Tolerance 2	Crumb Color 3 2 3 2 4 3 2 3 2 2 3 2 2 7 0.7 Fac Color 2	Grain & Texture 3 2 3 2 4 2 2 2 2 2 3 2.5 0.7 tors Comp Grain & Texture	Protein 3 2 3 3 4 3 3 4 3 0.5 bared to Gl	Milling 4 3 2 4 3 4 4 4 3 5 0.7 0.7 cenn Chec	Baking 4 3 3 3 1 2 4 2 4 2 3 2.8 0.9 k 8 aking 3	2 3 3 4 1 3 3 3 3 2.8 0.8 Overall 3
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Minot - M10 Cooperator 1 2	Absorption 59.0 62.0 65.0 67.2 64.0 64.9 72.3 64.9 68.8 65.1 3.7 Bake Absorption 60.0 63.5	Volume 2750 2750 3104 2950 2325 840 900 785 888 888 Loaf Volume 2750 3050	% of CK 94.8 98.2 98.1 100.0 101.7 86.1 88.4 100.0 89.7 99.9 95.7 5.6 LV % of CK 96.5 100.0	Requirement 3 3 3 3 3 3 3 3 3 4 2 3.2 0.8 Mixing Requirement 3 3 3	Characteristic 3 3 5 1 3 4 3 4 3 4 3 4 3 4 3 2 1.0 Dough Characteristic 3 4	Tolerance 2 4 3 4 5 3 4 5 3 4 5 0.8 Mix Tolerance 2 4	Crumb Color 3 2 3 3 2 4 3 2 3 2 2 3 3 2 2 7 0.7 Fac Crumb Color 2 2 2	Grain & Texture 3 2 3 2 4 2 2 2 2 2 2 2 2 3 3 2.5 0.7 tors Comp Grain & Texture	Protein 3 3 2 3 3 4 3 3 4 3 3 0 0.5 bared to GI Protein 3 3 3	Milling 4 3 4 4 4 4 4 3.5 0.7 enn Chec Milling 2 3	Baking 4 3 3 3 3 1 2 4 2 4 2 3 3 2.8 0.9 k Baking 3 2	2 3 3 4 1 3 3 3 3 2.8 0.8 Overall 3 3 3
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Minot - M10 Cooperator 1	Absorption 59.0 62.0 63.0 65.0 67.2 64.0 64.9 72.3 64.9 68.8 65.1 3.7 Bake Absorption 63.5 64.0	Volume 2750 2750 932 3104 2950 2325 840 900 785 888 888 Loaf Volume 2750 3050 942	% of CK 94.8 98.2 98.1 100.0 101.7 86.1 88.4 100.0 89.7 99.9 95.7 5.6 LV % of CK 96.5 100.0 90.8	Requirement 3 3 3 3 3 3 3 3 3 4 2 3 3.2 0.8 Mixing Requirement 3 2	Characteristic 3 3 5 1 3 4 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 5 5 5 5 5 5 5 5 5 5 5 5 5	Tolerance 2 4 3 4 5 3 4 5 0.8 Mix Tolerance 2 4 2	Crumb Color 3 2 3 2 4 3 2 3 2 2 3 2 2 7 0.7 Fac Color 2	Grain & Texture 3 2 3 2 4 2 2 2 2 2 2 3 2.5 0.7 tors Comp Grain & Texture 3 2 3	Protein 3 3 2 3 3 4 3 3 4 3 3 0.5 bared to GI Protein 3	Milling 4 3 2 4 3 4 4 4 3 4 3 5 0.7 enn Chec Milling 2 3 3 3	Baking 4 3 3 3 3 1 2 4 2 3 2 4 2 3 0.9 k Baking 3 2 2	2 3 3 4 1 3 3 3 3 3 2.8 0.8 Overall 3 3 2
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Minot - M10 Cooperator 1 2 3	Absorption 59.0 62.0 65.0 67.2 64.0 64.9 72.3 64.9 68.8 65.1 3.7 Bake Absorption 60.0 63.5	Volume 2750 2750 3104 2950 2325 840 900 785 888 888 Loaf Volume 2750 3050	% of CK 94.8 98.2 98.1 100.0 101.7 86.1 88.4 100.0 89.7 99.9 95.7 5.6 LV % of CK 96.5 100.0	Requirement 3 3 3 3 3 3 3 3 3 4 2 3.2 0.8 Mixing Requirement 3 3 3	Characteristic 3 3 5 1 3 4 3 4 3 4 3.2 1.0 Dough Characteristic 3 4 3 4 3.2 1.0	Tolerance 2 4 3 4 5 3 4 5 3 4 5 0.8 Mix Tolerance 2 4	Crumb Color 3 2 3 2 4 3 2 3 2 3 2 3 2 3 2 3 2 3 2 5 7 0.7 Fac Color 2 2 3	Grain & Texture 3 2 3 2 4 2 2 2 2 2 2 2 2 3 3 2.5 0.7 tors Comp Grain & Texture	Protein 3 3 2 3 3 4 3 3 4 3 3 0.5 bared to Gl Protein 3 2 2 2 3 3 4 3 3 4 3 3 3 3 4 3 3 3 3 3 4 3 3 3 3 3 3 3 3 3 3 3 3 3	Milling 4 3 4 4 4 4 4 3.5 0.7 enn Chec Milling 2 3	Baking 4 3 3 3 3 1 2 4 2 4 2 3 3 2.8 0.9 k Baking 3 2	2 3 3 4 1 3 3 3 3 2.8 0.8 Overall 3 3 3
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Minot - M10 Cooperator 1 2 3 4	Absorption 59.0 62.0 65.0 67.2 64.0 64.9 72.3 64.9 68.8 65.1 3.7 Bake Absorption 60.0 63.5 64.0 66.0	Volume 2750 2750 3104 2950 2325 840 900 785 888 Volume 2750 3050 942 3045	% of CK 94.8 98.2 98.1 100.0 101.7 86.1 88.4 100.0 89.7 99.9 95.7 5.6 LV % of CK 96.5 100.0 90.8 100.0	Requirement 3 3 3 3 3 3 3 3 3 3 3 3.2 0.8 Mixing Requirement 3 2 5	Characteristic 3 3 5 1 3 4 3 4 3.2 1.0 Dough Characteristic 3 4 3 5 5 5 5 5 5 5 5 5 5 5 5 5	Mix 7 0.8	Crumb Color 3 2 3 2 4 3 2 4 3 2 3 2 2 3 2 2,7 0,7 Fac Color 2 2 3 3 2 2 3 2 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 3 3 3 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	Grain & Texture 3 2 3 2 4 2 2 2 2 2 2 2 2 3 2 2 5 0.7 tors Comp Grain & Texture 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 3 2 2 3 3 2 2 4 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 4 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 4 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 3 2 2 3 3 2 2 3 3 2 2 3 3 3 2 2 3 3 3 2 2 3 3 3 2 3 3 3 2 2 3 3 3 2 2 3 3 3 3 2 2 3 3 3 3 2 2 3 3 3 3 3 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	Protein 3 2 3 3 4 3 3 4 3 3 0.5 bared to Gi Protein 3 3 2 2 2	Milling 4 3 2 4 3 4 4 4 4 3.5 0.7 enn Chec Milling 2 3 3 2	Baking 4 3 3 3 1 2 4 2 3 2 8 k Baking 3 2 2 2 2	2 3 3 4 1 3 3 3 3 2.8 0.8 Overall 3 3 2 2
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Minot - M10 Cooperator 1 2 3 4 5	Absorption 59.0 62.0 65.0 67.2 64.0 64.9 72.3 64.9 68.8 65.1 3.7 Bake Absorption 60.0 63.5 64.0 66.0 66.0 68.4	Volume 2750 2750 3104 2950 2325 840 900 785 888 Volume 2750 3050 942 3045 3275	% of CK 94.8 98.2 98.1 100.0 101.7 86.1 88.4 100.0 89.7 99.9 95.7 5.6 LV % of CK 96.5 100.0 90.8 100.0 90.8 100.0	Requirement 3 3 3 3 3 3 3 3 4 2 3 3.2 0.8 Mixing Requirement 3 2 5 2 5 2	Characteristic 3 3 5 1 3 4 3 4 3 4 3 4 3 2 1.0 Dough Characteristic 3 4 3 5 1 1 3 4 3 5 1 3 4 3 5 1 1 3 4 3 5 1 1 3 3 4 3 5 5 1 3 5 5 1 3 5 5 1 3 5 5 5 5 5 5 5 5 5 5 5 5 5	Mix 7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Crumb Color 3 2 3 2 4 3 2 4 3 2 2 3 2 2 3 2 2 7 6 7 Fac Color 2 2 3 2 2 4	Grain & Texture 3 2 3 2 4 2 2 2 2 2 2 2 2 3 2.5 0.7 tors Comp 6 Grain & Texture 3 2 3 2 4	Protein 3 3 2 3 3 4 3 3 4 3 3 4 3 3 0 0 5 bared to Gl Protein 3 2 1 1 2 1 1 2 1 3 3 4 3 3 2 3 3 3 4 3 3 3 3 3 3 3 3 3 3 3 3 3	Milling 4 3 4 4 3 4 4 4 3 5 0.7 0.7 enn Chec Milling 2 3 3 2 3 3	Baking 4 3 3 3 1 2 4 2 3 2 4 2 3 8 k Baking 3 2 2 2 4	2 3 3 4 1 3 3 3 3 2.8 0.8 Overall 3 3 2 2 2 3
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Minot - M10 Cooperator 1 2 3 4 5 6 6 7 8 9 10 Average ± 1 Std Dev	Absorption 59.0 62.0 65.0 65.2 64.0 64.9 72.3 64.9 68.8 65.1 3.7 Bake Absorption 60.0 63.5 64.0 66.0 66.0 66.0 66.4 65.0	Volume 2750 2750 3104 2950 2325 840 900 785 888 Loaf Volume 2750 3050 942 3045 3275 2900	% of CK 94.8 98.2 98.1 100.0 101.7 86.1 88.4 100.0 89.7 99.9 95.7 5.6 LV % of CK 96.5 100.0 90.8 100.0 90.8 100.0 102.3 98.3	Requirement 3 3 3 3 3 3 3 3 4 2 3 3.2 0.8 Mixing Requirement 3 2 5 5 2 2 2 2 2 2 2	Characteristic 3 3 5 1 3 4 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 5 5 1 3 3 4 4 3 5 5 5 5 5 5 5 5 5 5 5 5 5	Mix 7 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Crumb Color 3 2 3 3 2 4 3 2 3 2 2 3 3 2 2 7 0.7 Fac Color 2 2 3 2 2 4 3 3 2 4 3 3 2 4 3 3 2 4 4 3 3 2 4 5 3 3 2 3 3 2 4 4 3 3 2 3 3 3 2 4 4 3 3 3 2 3 3 3 2 4 4 3 3 3 3	Grain & Texture 3 2 3 2 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Protein 3 3 2 3 3 4 3 3 4 3 3 4 3 3 0.5 bared to GI Protein 3 3 2 2 1 3 3 1 3 4 3 3 4 3 3 4 3 3 4 5 5 5 5 6 6 7 1 1 1 1 1 1 1 1 1 1 1 1 1	Milling 4 3 2 4 3 4 4 4 4 3 5 0.7 enn Chec Milling 2 3 3 3 3 3 3 3 3 3 3 3 3 3	Baking 4 3 3 3 1 2 4 2 4 2 3 3 2 8 0.9 k Baking 3 2 2 2 4 3 2 2 4 3 2 4 3 3 3 3 3 3 3 3 3 3 3 3 3	2 3 3 4 1 3 3 3 3 2.8 0.8 Overall 3 3 2 2 3 3 3
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Minot - M10 Cooperator 1 2 3 4 5 6 7 7 8 9 10 Average ± 1 Std Dev	Absorption 59.0 62.0 63.0 65.0 67.2 64.0 64.9 72.3 64.9 68.8 65.1 3.7 Bake Absorption 60.0 63.5 64.0 66.0 66.0 66.0 66.1	Volume 2750 2750 932 3104 2950 2325 840 900 785 888 888 Volume 2750 3050 942 3045 3275 2900 1030	% of CK 94.8 98.2 98.1 100.0 101.7 86.1 88.4 100.0 89.7 99.9 95.7 5.6 LV % of CK 96.5 100.0 90.8 100.0 90.8 100.0 90.8 100.0	Requirement 3 3 3 3 3 3 3 3 4 2 3 4 2 3.2 0.8 Mixing Requirement 3 2 5 2 3 2 3 2 3	Characteristic 3 3 5 1 3 4 3 4 3 4 3 4 3 2 1.0 Dough Characteristic 3 4 3 5 1 3 4 3 5 1 3 4 3 5 1 3 4 3 5 1 3 5 1 3 5 1 3 5 1 3 5 1 3 5 1 3 5 1 3 5 5 1 3 5 5 1 3 5 5 1 3 5 5 1 3 5 5 1 5 5 1 5 5 1 5 5 5 1 5 5 1 5 5 5 1 5 5 5 5 1 5 5 5 5 5 5 5 5 5 5 5 5 5	Mix 2 4 3 4 5 3 4 5 3 4 5 0.8 Mix Tolerance 2 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Crumb Color 3 2 3 2 4 3 2 3 2 3 2 3 2 2 7 6 7 Fac Color 2 2 3 2 4 3 2 2 3 2 2 4 3 2 2 3 2 2 3 2 2 3 2 3	Grain & Texture 3 2 3 2 4 2 2 2 2 2 2 3 2.5 0.7 tors Comp Grain & Texture 3 2 3 2 4 4 4 2 2 3 2 4 4 2 2 2 3 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5	Protein 3 3 2 3 3 4 3 3 4 3 3 0.5 bared to Gl Protein 3 2 2 1 3 2 2 1 3 2 2 1 3 2 2 3 3 3 4 3 3 4 3 3 3 4 3 3 3 4 3 3 3 3 4 3 3 3 4 3 3 3 3 3 4 3 3 3 3 3 3 3 3 4 3 3 3 3 3 3 3 3 3 3 3 3 3	Milling 4 3 2 4 3 4 4 4 4 3 5 0.7 enn Chec Milling 2 3 3 2 3 2 3 2	Baking 4 3 3 3 3 1 2 4 2 3 2.8 0.9 k Baking 3 2 2 2 4 3 2 2 4 3 2 2 4 3 2 2 4 3 2 4 3 3 3 3 3 3 3 3 3 3 3 3 3	2 3 3 4 1 3 3 3 3 3 2 8 8 0.8 8 0.8 8 0.8 8 0.8 8 0.8 8 2 2 3 3 2 2 3 2
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Minot - M10 Cooperator 1 2 3 4 5 6 7 8 8 9 10 Average ± 1 Std Dev Minot - M10 Cooperator 1 2 3 4 5 6 7 8 8 9 10 Average 10 Average 10 Average 10 Average 10 Average 10 Average 10 Average 10 Average 10 Average 10 Average 10 Average 10 Average 10 Average 10 Average 10 Average 10 Average 10 Average 10 Average 10 Average 10 Average 10 Average 10 Average 10 Average 10 Average 10 Average 10 Average 10 Average 10 Average 10 Average 10 3 4 5 6 7 8 8 8 8 8 8 8 8 8 8 8 8 8	Absorption 59.0 62.0 65.0 67.2 64.0 64.9 72.3 64.9 68.8 65.1 3.7 Bake Absorption 60.0 63.5 64.0 66.0 66.1 65.1 68.4 65.0	Volume 2750 2750 3104 2950 2325 840 900 785 888 Volume 2750 3050 942 3045 3275 2900 1030 940	% of CK 94.8 98.2 98.1 100.0 101.7 86.1 88.4 100.0 89.7 99.9 95.7 5.6 LV % of CK 96.5 100.0 90.8 100.0 90.8 100.0 98.3 94.5 94.0	Requirement 3 3 3 3 3 3 3 3 3 3.2 0.8 Mixing Requirement 3 2 5 2 3 3 3 3 3 3 3 3 3	Characteristic 3 3 5 1 3 4 3 4 3.2 1.0 Dough Characteristic 3 4 3 5 1 3 5 1 3 5 1 1 3 4 3 5 1 1 3 5 1 1 3 5 1 1 3 5 1 1 3 5 1 1 3 5 1 1 3 5 1 1 3 5 1 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 1 1 1 1 1 1 1 1 1 1 1	Mix 7 3 4 5 3 4 5 3 4 5 0.8 Mix Tolerance 2 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Crumb Color 3 2 3 2 4 3 2 3 2 3 2 3 2 2 7 0.7 Fac Color 3 2 2 3 2 2 4 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 7 7 6 7 5 7 5 7 5 3 3 2 2 3 3 2 2 3 3 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 3 3 2 2 7 7 6 7 7 7 8 2 2 3 3 2 2 3 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 2 3 2 2 2 2 2 3 2 2 2 2 2 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Grain & Texture 3 2 3 2 4 2 2 2 2 2 2 2 3 2.5 0.7 tors Comp Grain & Texture 3 2 3 2 4 4 4 2 3 2 3 2 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 4 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 3 2 3 3 3 2 3 3 3 2 3 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 5 3 5 5 5 5	Protein 3 3 2 3 3 4 3 3 4 3 3 0.5 bared to Gl Protein 3 2 2 1 3 2 2 1 3 2 2 2 1 3 2 2 3 3 4 3 3 4 3 3 3 3 4 3 3 3 3 3 4 3 3 3 3 4 3 3 3 3 3 3 3 3 3 3 3 3 3	Milling 4 3 2 4 3 4 4 4 4 3 5 0.7 enn Chec Milling 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3 3 3 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	Baking 4 3 3 3 1 2 4 2 3 2 8 0.9 k Baking 3 2 2 4 3 2 2 4 3 2 2 4 3 2 3 3 3 3 3 3 3 3 3 3 3 3 3	2 3 3 4 1 3 3 3 3 2.8 0.8 Overall 3 3 2 2 3 3 2 3 3 2 3
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Minot - M10 Cooperator 1 2 3 4 5 6 7 8 9 9 10 Average ± 1 Std Dev Minot - M10 Cooperator 1 2 3 4 5 6 7 8 9 9 10 Average ± 1 Std Dev Minot - M10 Cooperator 1 2 3 4 5 6 7 8 9 9 10 Average 1 8 9 10 Average 1 8 9 10 Average 1 8 9 10 Average 1 8 9 10 Average 1 8 9 10 Average 1 8 9 10 2 1 1 1 1 1 1 1 1 1 1 1 1 1	Absorption 59.0 62.0 65.0 67.2 64.0 64.9 72.3 64.9 68.8 65.1 3.7 Bake Absorption 60.0 63.5 64.0 66.0 66.0 66.1 66.1 68.4 65.0 66.1 68.1 65.6	Volume 2750 2750 3104 2950 2325 840 900 785 888 888 Volume 2750 3050 942 3045 3275 2900 1030 940 820	% of CK 94.8 98.2 98.1 100.0 101.7 86.1 88.4 100.0 89.7 99.9 95.7 5.6 LV % of CK 96.5 100.0 90.8 100.0 102.3 98.3 94.5 94.0 92.7	Requirement 3 3 3 3 3 3 4 2 3 3.2 0.8 Mixing Requirement 3 2 5 2 3 2 3 2 3 2 3 2 3 2 3 2	Characteristic 3 3 5 1 3 4 3 4 3 4 3 4 3 2 1.0 Dough Characteristic 3 4 3 5 1 3 4 3 5 1 3 4 3 5 1 3 5 5 1 3 5 5 1 3 5 5 1 3 5 5 1 3 5 5 1 3 5 5 5 5 5 5 5 5 5 5 5 5 5	Mix Tolerance 2 4 3 4 5 3 4 5 0.8 Mix Tolerance 2 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Crumb Color 3 2 3 2 4 3 2 2 3 2 2 3 2 2 7 6 7 Fac Color 3 2 2 3 2 2 4 3 2 2 2 2 2 2 2 2 2 2	Grain & Texture 3 2 3 2 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Protein 3 3 2 3 3 4 3 3 4 3 3 4 3 3 0.5 bared to Gl Protein 3 3 2 2 1 3 2 2 3 3 4 3 3 4 3 3 4 3 3 4 3 3 3 4 3 3 3 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 4 4 3 3 3 3 3 4 4 3 3 3 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5	Milling 4 3 2 4 3 4 4 4 4 3 4 4 3 5 0.7 enn Chec Milling 2 3 3 2 3 3 2 3 3 2 3 3 3 2 3 3 3 3 2 3 3 3 3 3 3 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	Baking 4 3 3 3 1 2 4 2 3 2 2 8 8 8 8 8 8 8 8 8 8 8 8 8	2 3 3 4 1 3 3 3 3 2.8 0.8 Overall 3 3 2 2 3 3 3 2 2 3 3 3 3
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Minot - M10 Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev	Absorption 59.0 62.0 65.0 65.2 64.0 64.9 72.3 64.9 68.8 65.1 3.7 Bake Absorption 60.0 63.5 64.0 63.5 64.0 66.1 68.4 65.0 66.1 68.1 65.6 70.3	Volume 2750 2750 3104 2950 2325 840 900 785 888 888 Volume 2750 3050 942 3045 3275 2900 1030 940 820	% of CK 94.8 98.2 98.1 100.0 101.7 86.1 88.4 100.0 89.7 99.9 95.7 5.6 LV % of CK 96.5 100.0 90.8 100.0 90.8 100.0 90.8 100.0 90.8 100.0 90.8 100.0 90.8 100.0 90.8 100.0 90.8 100.0 90.8 100.0 90.8 100.0 90.8 100.0 90.7 87.8	Requirement 3 3 3 3 3 3 3 3 4 2 3 3.2 0.8 Mixing Requirement 3 2 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2 3 2	Characteristic 3 3 3 5 1 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 5 1 3 4 3 4 3 5 1 3 4 3 5 1 3 3 4 3 5 5 1 3 3 4 3 5 5 1 3 3 4 4 3 5 5 1 3 5 5 1 3 5 5 5 5 5 5 5 5 5 5 5 5 5	Mix 2 4 3 4 5 3 4 5 0.8 Mix Tolerance 2 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Crumb Color 3 2 3 2 4 3 2 2 3 2 2 3 2 2 7 0.7 Fac Crumb Color 3 2 2 2 3 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 4 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 7 7 0.7 5 7 5 7 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7	Grain & Texture 3 2 3 2 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Protein 3 3 2 3 3 4 3 3 4 3 3 4 3 3 0.5 bared to GI Protein 3 3 2 1 3 2 2 3 3 4 3 3 4 3 3 4 3 3 4 5 5 5 5 5 6 6 6 7 1 1 1 1 1 1 1 1 1 1 1 1 1	Milling 4 3 2 4 3 4 4 4 4 3 5 0.7 enn Chec Milling 2 3 3 2 3 3 2 3 3 3 3 3 3 3 3 3 3 3 3 3	Baking 4 3 3 3 1 2 4 2 4 2 3 2 2 8 0.9 k Baking 3 2 2 4 3 2 2 4 3 2 3 2 3 3 3 3 3 3 3 3 3 3 3 3 3	2 3 3 4 1 3 3 3 3 2.8 0.8

							Fac	tors Comp	ared to Gl	enn Chec	k	
Minot - M11	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &				
Cooperator	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Color	Texture	Protein	Milling	Baking	Overall
1	60.0	2700	94.7	3	3	2	2	3	3	2	3	3
2	62.0	3250	106.6	4	2	3	4	3	3	3	3	3
3	64.0	983	94.7	3	2	2	3	3	2	4	2	2
4	65.0	3162	101.9	5	5	2	2	2	2	2	2	2
5	66.8	3025	94.5	2	3	2	5	4	1	3	2	3
6	64.0	2750	93.2	2	3	2	3	4	3	5	3	3
7	64.5	1135	104.1	3	3	2	3	3	2	2	3	2
8	66.3	975	97.5	3	5	2	3	4	2	2	4	4
9	64.5	780	88.1	2	3	2	2	2	3	3	1	2
10	68.3	900	87.0	2	3	2	3	3	2	3	3	2
Average	64.5		96.2	2.9	3.2	2.1	3.0	3.1	2.3	2.9	2.6	2.6
± 1 Std Dev	2.4		6.4	1.0	1.0	0.3	0.9	0.7	0.7	1.0	0.8	0.7

							Fac	tors Comp	ared to GI	enn Chec	k	
Casseton - C12	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &				
Cooperator	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Color	Texture	Protein	Milling	Baking	Overall
1	60.0	3100	103.3	3	3	2	3	3	3	5	4	4
2	61.5	2950	105.4	4	2	4	5	4	3	2	5	4
3	64.0	990	93.4	3	4	2	3	3	2	2	2	2
4	65.0	3074	102.5	5	5	3	3	2	3	3	2	2
5	66.7	2500	88.5	2	2	2	5	5	3	3	2	2
6	63.0	2850	98.3	2	3	2	3	3	3	5	3	na
7	64.4	1045	102.0	2 3	3	2 2	3	4	3	4	3	2
8 9	68.0	970 905	95.6	3 1	3 3		4 3	4	2 3	4 2	4 2	4
9 10	64.1	905 908	94.3 89.9	1	3 4	3 2	3	4	3 3	4	2	2 3
Average	68.3 64.5	900	97.3	2.7	3.2	2.4	3.5	3.4	2.8	4 3.4	2.8	2.8
± 1 Std Dev	2.7		5.9	1.2	0.9	2.4	0.8	3.4 1.0	2.0 0.4	3.4 1.2	1.2	2.0 1.0
± 1 Stu Dev	2.1		5.9	1.2	0.9	0.7		tors Comp				1.0
Crookston - K12	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &			n	
Cooperator	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Color	Texture	Protein	Milling	Baking	Overall
1	58.0	2900	100.0	3	3	2	4	5	2	5	4	3
2	62.0	2300	96.4	3	4	3	4	4	1	3	3	3
3	60.0	883	92.9	2	4	2	3	2	2	3	2	2
4	65.0	3104	100.0	5	5	2	3	2	1	3	2	2
5	67.0	2950	100.0	2	3	3	5	5	1	3	2	4
6	64.0	2200	81.5	2	2	3	3	2	1	5	1	1
7	64.4	860	90.5	3	3	3	4	3	1	5	2	2
8	69.5	835	92.8	4	4	2	4	4	2	4	4	4
9	64.4	810	92.6	2	3	3	3	2	2	3	3	3
10	68.1	825	92.8	2	4	3	4	3	1	5	2	3
Average	64.2		94.1	2.8	3.3	2.7	3.7	3.3	1.4	3.9	2.6	2.7
± 1 Std Dev	3.5		5.9	1.0	0.9	0.5	0.7	1.2	0.5	1.0	1.0	0.9
									ared to GI			
Minot - M12	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &				
Minot - M12 Cooperator	Bake Absorption	Loaf Volume	LV % of CK	Mixing Requirement	Dough Characteristic	Mix Tolerance			Protein	Milling	Baking	Overall
							Crumb	Grain &				Overall 3
Cooperator	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Crumb Color	Grain & Texture	Protein	Milling	Baking	
Cooperator 1	Absorption 59.0	Volume 2775	% of CK 97.4	Requirement 3	Characteristic 2	Tolerance 2	Crumb Color 3	Grain & Texture 3	Protein 3	Milling 4	Baking 3	3
Cooperator 1 2	Absorption 59.0 62.0	Volume 2775 3150	% of CK 97.4 103.3	Requirement 3 3	Characteristic 2 3	Tolerance 2 2	Crumb Color 3 4	Grain & Texture 3 4	Protein 3 2	Milling 4 3	Baking 3 4	3 3
Cooperator 1 2 3	Absorption 59.0 62.0 63.0	Volume 2775 3150 985.0	% of CK 97.4 103.3 94.9	Requirement 3 3 3	Characteristic 2 3 3	Tolerance 2 2 2	Crumb Color 3 4 3	Grain & Texture 3 4 3	Protein 3 2 3	Milling 4 3 4	Baking 3 4 3	3 3 3
Cooperator 1 2 3 4	Absorption 59.0 62.0 63.0 65.0	Volume 2775 3150 985.0 3104	% of CK 97.4 103.3 94.9 100.0	Requirement 3 3 3 5	Characteristic 2 3 3 5	Tolerance 2 2 2 3	Crumb Color 3 4 3 4 3 4	Grain & Texture 3 4 3 2	Protein 3 2 3 2	Milling 4 3 4 4	Baking 3 4 3 2	3 3 3 2
Cooperator 1 2 3 4 5	Absorption 59.0 62.0 63.0 65.0 66.7	Volume 2775 3150 985.0 3104 3025	% of CK 97.4 103.3 94.9 100.0 94.5	Requirement 3 3 5 3	Characteristic 2 3 3 5 3	Tolerance 2 2 2 3 2 2	Crumb Color 3 4 3 4 5	Grain & Texture 3 4 3 2 4	Protein 3 2 3 2 1	Milling 4 3 4 4 3	Baking 3 4 3 2 2 2	3 3 3 2 3
Cooperator 1 2 3 4 5 6	Absorption 59.0 62.0 63.0 65.0 66.7 64.0	Volume 2775 3150 985.0 3104 3025 2800	% of CK 97.4 103.3 94.9 100.0 94.5 94.9	Requirement 3 3 5 3 2	Characteristic 2 3 3 5 3 3 3	Tolerance 2 2 2 3 2 2 2 2 2	Crumb Color 3 4 3 4 5 3 4 2	Grain & Texture 3 4 3 2 4 4 4	Protein 3 2 3 2 1 2	Milling 4 3 4 4 3 5	Baking 3 4 3 2 2 3 3 4	3 3 2 3 3 2 2 2
Cooperator 1 2 3 4 5 6 7	Absorption 59.0 62.0 63.0 65.0 66.7 64.0 64.7	Volume 2775 3150 985.0 3104 3025 2800 1095	% of CK 97.4 103.3 94.9 100.0 94.5 94.9 100.5	Requirement 3 3 5 3 2 2 2	Characteristic 2 3 5 5 3 3 3 3	Tolerance 2 2 2 3 2 2 2 1	Crumb Color 3 4 3 4 5 3 4 2 3	Grain & Texture 3 4 3 2 4 4 4 3	Protein 3 2 3 2 1 2 2 2	Milling 4 4 4 3 5 4	Baking 3 4 3 2 2 3 3 3	3 3 2 3 3 2 2
Cooperator 1 2 3 4 5 6 7 8	Absorption 59.0 62.0 63.0 65.0 66.7 64.0 64.7 67.0	Volume 2775 3150 985.0 3104 3025 2800 1095 920	% of CK 97.4 103.3 94.9 100.0 94.5 94.9 100.5 92.0	Requirement 3 3 5 3 2 2 2 1 3	Characteristic 2 3 5 5 3 3 3 5 5 3 2	Tolerance 2 2 3 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Crumb Color 3 4 3 4 5 3 4 2 3 2	Grain & Texture 3 4 3 2 4 4 3 4 3 4 3 4	Protein 3 2 3 2 1 2 2 2 2 2 2 2 2 2	Milling 4 3 4 3 5 4 2 2 4	Baking 3 4 3 2 2 3 3 4 2 4	3 3 2 3 3 2 2 2
Cooperator 1 2 3 4 5 6 7 8 9	Absorption 59.0 62.0 63.0 65.0 66.7 64.0 64.7 67.0 64.2	Volume 2775 3150 985.0 3104 3025 2800 1095 920 810	% of CK 97.4 103.3 94.9 100.0 94.5 94.9 100.5 92.0 91.5	Requirement 3 3 5 3 2 2 2 1	Characteristic 2 3 5 3 3 3 3 5 5 3	Tolerance 2 2 3 2 3 2 3 2 3 2 3 2 3 2 2 2 3 2 2 2 2 2	Crumb Color 3 4 3 4 5 3 4 2 3	Grain & Texture 3 4 3 2 4 4 3 4 3 3	Protein 3 2 3 2 1 2 2 2 2 2	Milling 4 3 4 3 5 4 2 2	Baking 3 4 3 2 2 3 3 4 2	3 3 2 3 3 2 2 2 2 3 2.6
Cooperator 1 2 3 4 5 6 7 8 9 9 10	Absorption 59.0 62.0 65.0 66.7 64.0 64.7 67.0 64.2 68.5	Volume 2775 3150 985.0 3104 3025 2800 1095 920 810	% of CK 97.4 103.3 94.9 100.0 94.5 94.9 100.5 92.0 91.5 82.1	Requirement 3 3 5 3 2 2 2 1 3	Characteristic 2 3 5 5 3 3 3 5 5 3 2	Tolerance 2 2 3 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Crumb Color 3 4 3 4 5 3 4 2 3 4 2 3 3 2 3.3 0.9	Grain & Texture 3 4 3 2 4 4 3 4 3 4 3.4 0.7	Protein 3 2 3 2 1 2 2 2 2 2 2 2 2 2 1 0.6	Milling 4 3 4 4 3 5 4 2 2 4 3.5 1.0	Baking 3 4 3 2 2 3 3 4 2 4 4 2 4 3.0 0.8	3 3 2 3 3 2 2 2 3
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev	Absorption 59.0 62.0 63.0 65.0 66.7 64.0 64.7 67.0 64.2 68.5 64.4 2.7	Volume 2775 3150 985.0 3104 3025 2800 1095 920 810 849	% of CK 97.4 103.3 94.9 100.0 94.5 94.9 100.5 92.0 91.5 82.1 95.1 5.9	Requirement 3 3 5 3 2 2 2 1 3 2.7	Characteristic 2 3 5 3 3 3 3 5 3 3 5 3 2 2 3.2 1.0	Tolerance 2 2 3 2 1 2 2 0 0 0 0	Crumb Color 3 4 5 3 4 2 3 3 2 3,3 0,9 Fac	Grain & Texture 3 4 3 2 4 3 4 3 4 3 4 3.4 0.7 tors Comp	Protein 3 2 3 2 1 2 2 2 2 2 2 2 2 2 1 0.6	Milling 4 3 4 4 3 5 4 2 2 4 3.5 1.0	Baking 3 4 3 2 2 3 3 4 2 4 4 2 4 3.0 0.8	3 3 2 3 3 2 2 2 2 3 2.6
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W12	Absorption 59.0 62.0 65.0 66.7 64.0 64.7 67.0 64.2 68.5 64.4 2.7 Bake	Volume 2775 3150 985.0 3104 3025 2800 1095 920 810 849	% of CK 97.4 103.3 94.9 100.0 94.5 94.9 100.5 92.0 91.5 82.1 95.1 5.9 LV	Requirement 3 3 5 3 2 2 2 1 3 2.7 1.1 Mixing	Characteristic 2 3 5 3 3 3 3 5 3 2 3.2 1.0 Dough	Tolerance 2 2 3 2 1 2 2 0.5	Crumb Color 3 4 3 4 5 3 4 2 3 3 4 2 3 3 2 9 Fac Crumb	Grain & Texture 3 4 3 2 4 4 3 4 3 4 0.7 tors Comp Grain &	Protein 3 2 3 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2	Milling 4 3 4 4 3 5 4 2 2 4 3.5 1.0 enn Chec	Baking 3 4 3 2 2 3 3 4 2 4 3.0 0.8 k	3 3 2 3 3 2 2 2 2 3 2.6 0.5
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W12 Cooperator	Absorption 59.0 62.0 65.0 66.7 64.0 64.7 67.0 64.2 68.5 64.4 2.7 Bake Absorption	Volume 2775 3150 985.0 3104 3025 2800 1095 920 810 849 849	% of CK 97.4 103.3 94.9 100.0 94.5 94.9 100.5 92.0 91.5 82.1 95.1 5.9 LV % of CK	Requirement 3 3 3 3 2 2 1 3 2.7 1.1 Mixing Requirement	Characteristic 2 3 5 3 3 3 3 5 3 3 5 3 2 3.2 1.0 Dough Characteristic	Tolerance 2 2 2 3 2 2 2 1 2 2 2 2 2 2 2 2 2 0 0.5 Mix Tolerance	Crumb Color 3 4 3 4 5 3 4 5 3 4 2 3 3 2 2 3.3 0.9 Fac Color Color	Grain & Texture 3 4 3 2 4 4 3 4 3 4 3 4 3 4 3 4 5 5 comp for s Comp Grain & Texture	Protein 3 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2	Milling 4 3 4 4 3 5 4 2 2 4 3.5 1.0 enn Chec Milling	Baking 3 4 2 2 3 3 4 2 4 3.0 0.8 k Baking	3 3 2 3 3 2 2 2 3 2.6 0.5
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W12 Cooperator 1	Absorption 59.0 62.0 65.0 66.7 64.0 64.7 64.2 68.5 64.4 2.7 Bake Absorption 61.0	Volume 2775 3150 985.0 3104 3025 2800 1095 920 8109 849 Loaf Volume 2975	% of CK 97.4 103.3 94.9 100.0 94.5 94.9 100.5 92.0 91.5 82.1 95.1 5.9 LV % of CK 104.4	Requirement 3 3 3 3 2 2 1 3 2.7 1.1 Mixing Requirement 5	Characteristic 2 3 5 3 3 3 3 5 3 2 3.2 1.0 Dough Characteristic 5	Tolerance 2 2 3 2 1 2 2 1 2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 3	Crumb Color 3 4 3 4 5 3 4 2 3 3 4 2 3 3 3 0.9 Fac Crumb Color 3	Grain & Texture 3 4 3 2 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 0.7 tors Comp Grain & Texture	Protein 3 2 3 2 2 2 2 2 2 2 2 2 2 2 2 2	Milling 4 3 4 4 3 5 4 2 2 4 3.5 1.0 enn Chec Milling 4	Baking 3 4 3 2 2 3 3 4 2 4 3.0 0.8 k Baking 3	3 3 2 3 3 2 2 2 3 3 2.6 0.5 Overall 3
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W12 Cooperator 1 2	Absorption 59.0 62.0 65.0 66.7 64.0 64.7 67.0 64.2 68.5 64.4 2.7 Bake Absorption 61.0 60.5	Volume 2775 3150 985.0 3104 3025 2800 1095 920 810 849 Loaf Volume 2975 2900	% of CK 97.4 103.3 94.9 100.0 94.5 94.9 100.5 92.0 91.5 82.1 95.1 5.9 LV % of CK 104.4 93.5	Requirement 3 3 3 3 2 2 1 3 2 1 3 1.1 Mixing Requirement 5 2	Characteristic 2 3 5 3 3 5 3 3 5 3 2 3.2 1.0 Dough Characteristic 5 3	Tolerance 2 2 3 2 1 2 2 0.5 Mix Tolerance 3 4	Crumb Color 3 4 3 4 5 3 4 2 3 3 4 2 3 3 4 2 2 3 3 0.9 Fac Color 3 5	Grain & Texture 3 4 3 2 4 3 4 3 4 3 4 3 4 0.7 tors Comp Grain & Texture 3 4	Protein 3 2 3 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2	Milling 4 3 4 4 3 5 4 2 2 4 3.5 1.0 enn Chec Milling 4 3	Baking 3 4 3 2 2 3 4 2 3 4 2 4 3.0 0.8 k Baking 3 2	3 3 2 3 3 2 2 2 2 3 2,6 0.5 Overall 3 3
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W12 Cooperator 1 2 3	Absorption 59.0 62.0 65.0 66.7 64.0 64.7 67.0 64.2 68.5 64.4 2.7 Bake Absorption 61.0 60.5 64.0	Volume 2775 3150 985.0 3104 3025 2800 1095 920 810 849 Loaf Volume 2975 2900 2900 1092	% of CK 97.4 103.3 94.9 100.0 94.5 94.9 100.5 92.0 91.5 82.1 95.1 5.9 LV % of CK 104.4 93.5 99.5	Requirement 3 3 3 3 2 2 1 3 2.7 1.1 Mixing Requirement 5 5 5	Characteristic 2 3 5 3 3 3 3 5 3 2 3.2 1.0 Dough Characteristic 5 3 4	Mix Tolerance 2 2 3 2 1 2 2 2 2 3 4 3	Crumb Color 3 4 3 4 5 3 4 2 3 3 4 2 3 3 2 3 3 0.9 Fac Color 3 5 3	Grain & Texture 3 4 3 2 4 4 3 4 3 4 3 4 0.7 tors Comp Grain & Texture 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3	Protein 3 2 3 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2	Milling 4 3 4 4 3 5 4 2 2 4 3.5 1.0 enn Chec Milling 4 3 3	Baking 3 4 3 2 2 3 3 4 2 4 3 0 0.8 k Baking 3 2 3 3 4 2 4 3 3 4 2 4 3 3 4 2 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 3 4 3 3 4 3 3 4 3 3 3 3 3 3 4 3 3 3 3 3 3 3 3 3 3 3 3 3	3 3 2 3 3 2 2 2 2 3 3 2,6 0,5 Overall 3 3 3
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W12 Cooperator 1 2 3 4	Absorption 59.0 62.0 65.0 66.7 64.0 64.7 67.0 64.2 68.5 64.4 2.7 Bake Absorption 61.0 60.5 64.0 61.0 60.5 64.0	Volume 2775 3150 985.04 3104 3025 2800 1095 920 810 849 Volume 2975 2900 1092 3162	% of CK 97.4 103.3 94.9 100.0 94.5 94.9 100.5 92.0 91.5 82.1 95.1 5.9 LV % of CK 104.4 93.5	Requirement 3 3 3 5 3 2 2 2 1 3 2.7 1.1 Mixing Requirement 5 2 5 5 5 5	Characteristic 2 3 5 3 3 3 5 3 2 3.2 1.0 Dough Characteristic 5 3 4 5	Mix Tolerance 2 2 3 2 2 1 2 2 2 0.5 Mix Tolerance 3 4 3 3	Crumb Color 3 4 3 4 5 3 4 2 2 3.3 4 2 3.3 0.9 Fac Color 3 5 3 4	Grain & Texture 3 4 3 2 4 4 3 4 3 4 3 4 0.7 tors Comp Grain & Texture 3 4 3 4	Protein 3 2 3 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2	Milling 4 3 4 4 3 5 4 2 2 4 3.5 1.0 enn Chec Milling 4 3 4 3 4	Baking 3 4 2 2 3 4 2 4 3.0 0.8 k Baking 3 2 3 4 2 4 3.0 0.8 k	3 3 2 3 3 2 2 2 2 3 3 2.6 0.5 Overall 3 3 3 3
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W12 Cooperator 1 2 3 4 5	Absorption 59.0 62.0 65.0 66.7 64.0 64.7 67.0 64.2 68.5 64.4 2.7 Bake Absorption 61.0 60.5 64.0	Volume 2775 3150 985.0 3104 3025 2800 1095 920 810 849 Loaf Volume 2975 2900 2900 1092	% of CK 97.4 103.3 94.9 100.0 94.5 94.9 100.5 92.0 91.5 82.1 95.1 5.9 LV % of CK 104.4 93.5 99.5	Requirement 3 3 3 5 3 2 2 2 1 3 2.7 1.1 Mixing Requirement 5 2 5 3 3	Characteristic 2 3 5 3 3 3 3 5 3 2 3.2 1.0 Dough Characteristic 5 3 4	Mix Tolerance 2 2 2 2 1 2 2 2 2 2 2 2 2 2 3 4 3 2 2	Crumb Color 3 4 3 4 5 3 4 2 3 3 4 2 3 3 3 4 5 3 3 4 5	Grain & Texture 3 4 3 2 4 3 4 3 4 3 4 3.4 0.7 tors Comp Grain & Texture 3 4 3 4 5	Protein 3 2 3 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2	Milling 4 3 4 4 3 5 4 2 2 4 3.5 1.0 enn Chec Milling 4 3 3	Baking 3 4 3 2 2 3 3 4 2 4 3 4 3 0 8 k Baking 3 2 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 3 4 5 5 6 6 8 8 8 8 8 8 8 8 8 8 8 8 8	3 3 2 3 3 2 2 2 2 3 3 2,6 0,5 Overall 3 3 3
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W12 Cooperator 1 2 3 4 5 6 6 7 8 9 10 Average ± 1 Std Dev	Absorption 59.0 62.0 65.0 66.7 64.0 64.7 67.0 64.2 68.5 64.4 2.7 Bake Absorption 61.0 60.5 64.0 61.0 60.5 64.0	Volume 2775 3150 985.0 3104 2800 1095 920 8109 840 849 Volume 2975 2900 1092 3162 23275 2295	% of CK 97.4 103.3 94.9 100.0 94.5 94.9 100.5 92.0 91.5 82.1 95.1 5.9 LV % of CK 104.4 93.5 99.5 100.0 100.8 101.7	Requirement 3 3 5 3 2 2 2 1 3 2.7 1.1 Mixing Requirement 5 2 5 5 3 4	Characteristic 2 3 5 3 3 5 3 3 5 3 2 2 3.2 1.0 Dough Characteristic 5 3 4 5 4 4 4	Mix 7 2 2 3 2 1 2 2 1 2 2 1 2 2 2 3 4 3 2 4 3 4 3 4	Crumb Color 3 4 3 4 5 3 4 2 3 3 4 2 3 3 0.9 Fac Crumb Color 3 5 3 4 5 4	Grain & Texture 3 4 3 2 4 3 4 3 4 3 4 3 4 3 4 5 3 4 5 3	Protein 3 2 3 2 2 2 2 2 2 2 2 2 2 2 2 2	Milling 4 3 4 4 3 5 4 2 2 4 3.5 1.0 enn Chec Milling 4 3 4 3 4 3 4 3 4 3 4 4 3 4 4 4 4 4 5 5 4 4 4 4 5 5 1.0 6 6 6 6 7 1.0 6 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 7 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	Baking 3 4 3 2 2 3 3 4 2 3 4 3 2 3 4 3 2 3 4 3 3 4 3 3 4 3 3 4 4 3 3 4 4 3 3 4 4 5 6 8 8 8 8 8 8 8 8 8 8 8 8 8	3 3 2 3 3 2 2 2 3 3 2 2 3 3 2 2 6 0.5 Overall 3 3 3 3 4
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W12 Cooperator 1 2 3 4 5 6 7 7 8 9 10 Average ± 1 Std Dev	Absorption 59.0 62.0 63.0 65.0 66.7 64.0 64.7 67.0 64.2 68.5 64.4 2.7 Bake Absorption 61.0 60.5 64.0 62.0 65.5 62.0 63.4	Volume 2775 3150 985.0 3104 3025 2800 1095 920 810 849 Volume 2975 2900 1092 3162 3275 2950 1075	% of CK 97.4 103.3 94.9 100.0 94.5 94.9 100.5 92.0 91.5 82.1 95.1 5.9 LV % of CK 104.4 93.5 99.5 100.0 100.8 101.7 87.8	Mequirement 3 3 3 3 2 2 1 3 2 2 1 3 2 1 3 2 2 1 3 4	Characteristic 2 3 5 3 3 5 3 3 5 3 2 3.2 1.0 Dough Characteristic 5 3 4 5 4 5 4 2	Mix Tolerance 2 2 3 2 1 2 2 2 2 0.5 Mix Tolerance 3 4 3 2 4 2 2	Crumb Color 3 4 3 4 5 3 4 2 3 3 4 2 2 3 3 4 2 2 3 3 0.9 Fac Color 3 5 3 4 4 5 4 4 4	Grain & Texture 3 4 3 2 4 3 4 3 4 3 4 3 4 5 3 4 5 3 3 3	Protein 3 2 3 2 2 2 2 2 2 2 2 2 2 2 2 2	Milling 4 3 4 4 3 5 4 2 2 4 3 5 1.0 enn Chec Milling 4 3 3 4 4 4 3 4 4 4 3 4 4 4 4 4 4 4 5 5 4 4 4 4 4 5 5 6 6 6 6 6 6 6 6 6 6 6 6 6	Baking 3 4 3 2 2 3 4 2 3 4 3.0 0.8 k Baking 3 2 3 4 3 2 3 4 3 2 3 4 3 2 3 4 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 6 8 8 8 8 8 8 8 8 8 8 8 8 8	3 3 2 3 3 2 2 2 3 2 2 3 2 2 6 0.5 Overall 3 3 3 3 3 4 2
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W12 Cooperator 1 2 3 4 5 6 7 8 8 9 10 Average ± 1 Std Dev	Absorption 59.0 62.0 65.0 66.7 64.0 64.7 67.0 64.2 68.5 64.4 2.7 Bake Absorption 61.0 60.5 64.0 60.5 64.0 65.5 62.0 63.4 71.7	Volume 2775 3150 985.0 3104 3025 2800 1095 920 810 849 Volume 2975 2900 1092 3162 3275 2950 1092 3162 3275 2950 1075 1030	% of CK 97.4 103.3 94.9 100.0 94.5 94.9 100.5 92.0 91.5 82.1 95.1 5.9 LV % of CK 104.4 93.5 99.5 100.0 100.8 101.7 87.8 90.7	Requirement 3 3 3 3 2 2 1 3 2.7 1.1 Mixing Requirement 5 5 3 4 3	Characteristic 2 3 5 3 3 5 3 3 5 3 2 3.2 1.0 Dough Characteristic 5 3 4 5 4 5 4 4 4 2 4	Mix Tolerance 2 2 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 3 4 3 2 4 2 4 2	Crumb Color 3 4 3 4 5 3 4 2 3 3 4 2 3 3 2 3 3 9 Fac Color 3 5 3 4 5 3 4 5 3 4 5 3 4 5 3 4 5 3 4 5 5 3 5 5 5 5	Grain & Texture 3 4 3 2 4 4 3 4 3 4 3 4 0.7 tors Comp Grain & Texture 3 4 5 3 4 5 3 3 3 3 3	Protein 3 2 3 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2	Milling 4 3 4 4 2 2 4 3.5 1.0 enn Chec Milling 4 3 4 3 4 3 4 2 2 4 5 1.0 enn Chec	Baking 3 4 3 2 2 3 4 2 4 3 0.8 k Baking 3 2 3 4 3 2 3 4 3 2 3 4 3 2 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 6 8 8 8 8 8 8 8 8 8 8 8 8 8	3 3 2 3 3 2 2 2 2 3 2.6 0.5 Overall 3 3 3 3 3 4 2 3
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W12 Cooperator 1 2 3 4 5 6 7 8 9 9 10 Average ± 1 Std Dev	Absorption 59.0 62.0 63.0 65.0 66.7 64.0 64.7 67.0 64.2 68.5 64.4 2.7 Bake Absorption 61.0 60.5 64.0 62.0 65.5 62.0 63.4	Volume 2775 3150 985.0 3104 3025 2800 1095 920 810 849 Volume 2975 2900 1092 3162 3275 2950 1075	% of CK 97.4 103.3 94.9 100.0 94.5 94.9 100.5 92.0 91.5 82.1 95.1 5.9 LV % of CK 104.4 93.5 99.5 100.0 100.8 101.7 87.8	Mequirement 3 3 3 3 2 2 1 3 2 2 1 3 2 1 3 2 2 1 3 4	Characteristic 2 3 5 3 3 5 3 3 5 3 2 3.2 1.0 Dough Characteristic 5 3 4 5 4 5 4 2	Mix Tolerance 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 3 4 3 2 4 2 4 2 4 2 4 2	Crumb Color 3 4 3 4 5 3 4 2 3 3 4 2 3 3 4 2 2 3 3 0.9 Fac Color 3 5 3 4 4 5 4 4 4	Grain & Texture 3 4 3 2 4 3 4 3 4 3 4 3 4 5 3 4 5 3 3 3	Protein 3 2 3 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2	Milling 4 3 4 4 3 5 4 2 2 4 3 5 1.0 enn Chec Milling 4 3 3 4 4 4 3 4 4 3 4 4 4 4 5 5 6 6 6 6 6 6 6 6 6 6 6 6 6	Baking 3 4 3 2 2 3 4 2 3 4 3.0 0.8 k Baking 3 2 3 4 3 2 3 4 3 2 3 4 3 2 3 4 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 6 8 8 8 8 8 8 8 8 8 8 8 8 8	3 3 2 3 3 2 2 2 3 2 2 3 2 2 6 0.5 Overall 3 3 3 3 3 4 2
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W12 Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev	Absorption 59.0 62.0 65.0 66.7 64.0 64.7 64.0 64.2 68.5 64.4 2.7 Bake Absorption 61.0 60.5 64.0 60.5 64.0 65.5 62.0 65.5 62.0 63.4 71.7 63.4 67.4	Volume 2775 3150 985.0 3104 3025 2800 1095 920 810 849 Volume 2975 2900 1092 3162 3275 2950 1092 3162 3275 2950 1075 1030	% of CK 97.4 103.3 94.9 100.0 94.5 94.9 100.5 92.0 91.5 82.1 95.1 5.9 LV % of CK 104.4 93.5 99.5 100.0 100.8 101.7 87.8 90.7 96.6 93.7	Mequirement 3 3 3 3 2 2 1 3 2.7 1.1 Mixing Requirement 5 2 5 3 4 3 4 2 3	Characteristic 2 3 5 3 3 5 3 3 2 3.2 1.0 Dough Characteristic 5 3 4 5 4 4 2 4 4 2 4 4 4 4 4 4	Mix 7 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 3 4 3 2 4 2 4 2 4 2 4 2 4 2 4 2 4 2 2 2	Crumb Color 3 4 3 4 5 3 4 2 3 3 4 2 3 3 3 0.9 Fac Crumb Color 3 5 3 4 5 4 4 4 3 5 5 4 4 5 5 4 4 5 5 5 4 5 5 5 4 5 5 5 5 6 7 6 7 7 7 7 7 7 7 7 7 7 7 7 7	Grain & Texture 3 4 3 2 4 3 4 3 4 3 4 3 4 3 4 5 3 3 4 5 3 3 4 4 4 4	Protein 3 2 3 2 2 2 2 2 2 2 2 2 2 2 2 2	Milling 4 3 4 4 3 5 4 2 2 4 3.5 1.0 enn Chec Milling 4 3 4 3 4 4 2 2 4 3.5 1.0 enn Chec 4 3 4 4 3 5 4 4 4 3 5 4 4 4 5 4 4 5 5 1.0 6 6 6 6 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 8 8 8 8 8 8 8 8 8 8 8 8	Baking 3 4 3 2 2 3 3 4 2 4 3 4 2 4 3 2 3 4 2 3 4 2 3 4 2 3 4 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 4 3 3 4 2 4 3 3 4 2 4 3 3 4 2 4 3 8 8 8 8 8 8 8 8 8 8 8 8 8	3 3 2 3 3 2 2 2 3 2 2 3 3 2.6 0.5 Overall 3 3 3 3 4 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W12 Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W12 Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W12 Cooperator 1 2 3 4 5 6 7 8 9 10 Average 10 Average 10 Average 10 10 Average 10 10 Average 10 10 10 10 10 10 10 10 10 10	Absorption 59.0 62.0 63.0 65.0 66.7 64.0 64.7 67.0 64.2 68.5 64.4 2.7 Bake Absorption 61.0 60.5 64.0 60.5 64.0 65.5 62.0 63.4 71.7 63.4 67.4 64.1	Volume 2775 3150 985.0 3104 3025 2800 1095 920 810 849 Volume 2975 2900 1092 3162 3275 2950 1075 1030 1000	% of CK 97.4 103.3 94.9 100.0 94.5 92.0 91.5 82.1 95.1 5.9 LV % of CK 104.4 93.5 99.5 100.0 100.8 101.7 87.8 90.7 96.6 93.7 96.9	Mequirement 3 3 3 3 2 2 1 3 2 1 3 2 1 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 4 3 3	Characteristic 2 3 5 3 3 5 3 2 3.2 1.0 Dough Characteristic 5 3 4 5 4 5 4 5 4 5 3 4 5 3 4 5 3 4 5 3 4 5 3 4 5 3 4 5 3 4 5 3 4 5 3 4 5 3 4 5 3 4 5 3 4 5 3 3 5 5 3 6 6 7 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 8 8 8 8 8 8 8 8 8 8 8 8	Mix 7 2 2 3 2 1 2 2 2 2 2 2 2 2 2 3 4 2 4 2 2 2	Crumb Color 3 4 3 4 5 3 4 2 3 3 4 2 2 3 3 4 2 2 3 3 5 5 3 4 5 5 4 4 4 5 5 4 4 5 5 4 4 0.9	Grain & Texture 3 4 3 2 4 3 4 3 4 3 4 3 4 3 4 5 3 3 3 4 4 5 3 3 3 4 4 4 3.6	Protein 3 2 3 2 2 2 2 2 2 2 2 2 2 2 2 2	Milling 4 3 4 4 2 2 4 3.5 1.0 enn Chec Milling 4 3 4 3 4 4 2 4 3.5 1.0 enn Chec Milling 4 3 3 4 4 3 5 4 3 5 4 3 5 4 3 5 5 4 3 5 5 6 6 6 6 6 6 6 6 6 6 6 6 6	Baking 3 4 3 2 2 3 3 4 2 4 3 3 4 3 2 3 4 3 3 2 3 3 3 2 3 3 2 3 3 4 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 4 2 4 2 4 2 4 2 4 3 3 4 2 4 4 2 4 4 2 4 4 2 4 4 5 6 8 8 8 8 8 8 8 8 8 8 8 8 8	3 3 2 2 3 3 2 2 2 3 3 2.6 0.5
Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev Williston - W12 Cooperator 1 2 3 4 5 6 7 8 9 10 Average ± 1 Std Dev	Absorption 59.0 62.0 65.0 66.7 64.0 64.7 64.0 64.2 68.5 64.4 2.7 Bake Absorption 61.0 60.5 64.0 60.5 64.0 65.5 62.0 65.5 62.0 63.4 71.7 63.4 67.4	Volume 2775 3150 985.0 3104 3025 2800 1095 920 810 849 Volume 2975 2900 1092 3162 3275 2950 1075 1030 1000	% of CK 97.4 103.3 94.9 100.0 94.5 94.9 100.5 92.0 91.5 82.1 95.1 5.9 LV % of CK 104.4 93.5 99.5 100.0 100.8 101.7 87.8 90.7 96.6 93.7	Mequirement 3 3 3 3 2 2 1 3 2.7 1.1 Mixing Requirement 5 2 5 3 4 3 4 2 3	Characteristic 2 3 5 3 3 5 3 3 2 3.2 1.0 Dough Characteristic 5 3 4 5 4 4 2 4 4 2 4 4 4 4 4 4	Mix 7 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 3 4 3 2 4 2 4 2 4 2 4 2 4 2 4 2 4 2 2 2	Crumb Color 3 4 3 4 5 3 4 2 3 3 4 2 3 3 3 0.9 Fac Crumb Color 3 5 3 4 5 4 4 4 3 5 5 4 4 5 5 4 4 5 5 5 4 5 5 5 4 5 5 5 5 6 7 6 7 7 7 7 7 7 7 7 7 7 7 7 7	Grain & Texture 3 4 3 2 4 3 4 3 4 3 4 3 4 3 4 5 3 3 4 5 3 3 4 4 4 4	Protein 3 2 3 2 2 2 2 2 2 2 2 2 2 2 2 2	Milling 4 3 4 4 3 5 4 2 2 4 3.5 1.0 enn Chec Milling 4 3 4 3 4 4 2 2 4 3.5 1.0 enn Chec 4 3 4 4 3 5 4 4 4 3 5 4 4 4 5 4 4 5 5 1.0 6 6 6 6 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 8 8 8 8 8 8 8 8 8 8 8 8	Baking 3 4 3 2 2 3 3 4 2 4 3 4 2 4 3 2 3 4 2 3 4 2 3 4 2 3 4 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 2 3 3 4 2 4 3 3 4 2 4 3 3 4 2 4 3 3 4 2 4 3 8 8 8 8 8 8 8 8 8 8 8 8 8	3 3 2 3 3 2 2 2 3 2.6 0.5

							Fac	tors Comp	ared to GI	enn Chec	k	
Watertown - B13	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &				
Cooperator	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Color	Texture	Protein	Milling	Baking	Overall
1	61.0	2650	96.4	2	1	1	1	1	3	4	1	1
2	65.0	3000	105.3	4	4	3	3	3	3	3	2	4
3	64.0	990	95.8	2	2	2	3	3	3	3	2	2
4	66.0	2927	96.1	4	3	2	3	1	3	3	2	2
5	70.0	3200	104.1	3	1	3	4	4	3	3	4	3
6	65.0	2625	95.5	3	2	2	3	3	3	3	2	3
7	67.7	1055	101.9	2	2	2	2	3	3	4	2	3
8	71.2	1015	96.7	2	3	2	3	5	3	2	5	4
9	67.2	905	87.4	2	3	3	2	3	3	3	2	3
10	71.9	952	95.0	2	3	2	2	5	3	2	2	2
Average	66.9		97.4	2.6	2.4	2.2	2.6	3.1	3.0	3.0	2.4	2.7
± 1 Std Dev	3.4		5.2	0.8	1.0	0.6	0.8	1.4	0.0	0.7	1.2	0.9

							Fac	tors Comp	ared to GI	enn Chec	k	
Williston - W14	Bake	Loaf	LV	Mixing	Dough	Mix	Crumb	Grain &				
Cooperator	Absorption	Volume	% of CK	Requirement	Characteristic	Tolerance	Color	Texture	Protein	Milling	Baking	Overall
1	62.0	2975	104.4	5	5	3	3	3	3	4	3	3
2	60.0	3450	111.3	3	4	3	4	4	3	3	5	5
3	64.0	1120	102.0	5	5	4	3	3	3	3	4	4
4	63.0	3104	98.2	5	5	3	4	3	2	4	3	3
5	65.2	3125	96.2	4	4	3	5	5	3	3	3	3
6	62.0	2950	101.7	5	4	4	4	3	3	4	3	4
7	62.7	1100	89.8	3	3	4	4	2	2	4	2	3
8	72.7	1110	97.8	5	4	4	2	2	3	2	3	3
9	62.9	1015	98.1	2	4	2	4	4	3	3	3	3
10	66.7	1068	94.7	3	3	3	3	3	3	3	2	3
Average	64.1		99.4	4.0	4.1	3.3	3.6	3.2	2.8	3.3	3.1	3.4
± 1 Std Dev	3.5		5.9	1.2	0.7	0.7	0.8	0.9	0.4	0.7	0.9	0.7

Appendix

	Page #
Appendix	41
Source of Wheat	42
Field Plot Locations and Procedures	42
2009 Hard Spring Wheat Production Sites	43
Description of 2009 Hard Spring Wheat Lines	44-47
Grain Cleaning and Milling Procedures	48-49
Methods of Analyses	50-51
Test Bake Procedures	51
Bake Cooperators	51
2009 Spring Wheat Field Production Data	52-56
Wheat Marketing Score	57-59
Cumulative Ash Curves (by location)	60-65
Mixograms	66-71
Farinograms	72-84
Bread Images (100g loaves – USDA/WQL)	85-89
Wheat Quality Characteristics (by location)	90-93

Source of Wheat

Source – Breeding Program	Code#	Identification
www	1	Α
AgriPro	2	01S0263-2B
North Dakota State University	3	ND811
Westbred	4	CA905-776
South Dakota State University	5	SD3948
WWW	6	В
North Dakota State University	7	ND810
Westbred	8	CA905-780
University Minnesota	10	MN03196
Westbred	11	BZ903-504
Norrth Dakota State University	12	ND808
South Dakota State University	13	SD4011
Westbred	14	CA905-781
North Dakota State University	9	Glenn Check

Field Plot Locations and Procedures

The experimental lines and Glenn check cultivar were grown at the following locations in the spring wheat region:

South Dakota State University, Watertown, SD – Jack Ingmanson Northwest Experiment Station, Crookston, MN – John Wiersma Agronomy Seed Farm, Casselton, ND – Tom Teigen North Central Agricultural Experiment Station, Minot, ND – Jay Fisher Williston Agricultural Experiment Station, Williston, ND

Wheat was seeded in large-scale plots of ½ acre in size to approximate commercial production. Cultural practices such as tillage and weed control common to each area were used. Consideration was also given to germination, seed size, and planting depth to provide stand uniformity. Based on soil test results from each location, nitrogen fertilizer was applied to the test plots at rates approaching higher levels than used commercially to more fully express the potential of each experimental line. Levels of phosphorus and potassium were applied in sufficient amounts so as not to be limiting factors. Each plot was individually harvested and the grain produced was thoroughly blended to obtain a uniform sample representing the entire plot.

2009 Hard Spring Wheat Production Sites

Entry #	Entry	Reference	Watertn	Cassel	Crooks	Minot	Willis
1	Α	www				Х	Х
2	01S0263-28	AgriPro	Х	Х		Х	
3	ND811	NDSU		Х	Х	Х	Х
4	CA905-776	Westbred		Х			
5	SD3948	SDSU	Х	Х	Х	Х	
6	В	www				Х	Х
7	ND810	NDSU		Х	Х	Х	Х
8	CA905-780	Westbred	Х				
9	Glenn	Check	Х	Х	Х	Х	Х
10	MN03196	Un of MN	Х	Х	Х	Х	
11	BZ903-504	Westbred				Х	
12	ND808	NDSU		Х	Х	х	Х
13	SD4011	SDSU	Х				
14	CA905-781	Westbred					Х

A (SWQAC 1)

ARGBR1347 is a hard red spring wheat, developed by World Wide Wheat LLC (W3), using male sterile facilitated recurrent selection (MSFRS) population breeding methodology. It originated as a single F2 head selection out of W3's Argentinean nursery in 2003. Single head selection continued through the F5 generation. ARGBR1347 has been tested in replicated yield trials since 2005 at several W3 global locations with much success. The line possesses a high-yielding potential under adequate moisture conditions. It is resistant to stripe rust, and found to be adapted to Arizona, California and Argentinean environments.

01S0263-28 (SWQAC 2)

01S0263-28 is a hard red spring wheat developed by Syngenta Cereals. At this time, it is undergoing increase for release to Associates in 2011 with certified seed available for growers in the 2012 season. Its pedigree is "Norpro/Kelby". It has medium maturity and very good test weight. It is a short semidwarf, slightly taller than Kelby. Straw strength is very good, between Kelby and Kuntz. It is resistant to stem rust and moderately resistant to leaf rust. Protection to foliar diseases has been very good. Tolerance to FHB has been intermediate. Protein levels have been high, slightly lower than Kelby. 01S0263-28 is broadly adapted for the spring wheat growing areas of the Northern Plains.

ND811 (SWQAC 3)

ND811 is a hard red spring wheat (HRSW) wheat line selected from the DAPPS/2*REEDER cross. Dapps and Reeder are two HRSW cultivars released by NDSU. Dapps is an excellent quality cultivars and Reeder is well adapted to ND western regions and MT dry environments. ND811 is widely adapted to ND environments. It has an excelled performance, particularly in western region where Reeder is commonly grown. Overall, ND811 has a high grain yield, higher than most grown cultivars, particularly in the Western region. It is a semi-dwarf line and medium late (similar to Faller) and has a medium to strong straw strength similar to Alsen and Glenn. The protein level of ND811 is medium, similar to Reeder. ND811 has an average to good milling and baking properties similar to Reeder. Similarly, the test weight of ND811 is similar to Reeder. Overall ND811 has a good leaf diseases package and is medium susceptible to scab similar.

CA905-776 (SWQAC 4)

WB-Gary (Express/Knudson) is a good standing, medium height, later maturing version of high-yielding Samson. It will outyield Samson in long season environments under intense management. WB-Gary is resistant to stem rust, moderately resistant to moderately susceptible to leaf rust and susceptible to

stripe rust. It is moderately resistant to moderately susceptible to foliar disease (tan spot and Septoria) and susceptible to Fusarium head blight. WB-Gary has medium protein and test weight with an average SDS Sedimentation value of 118 mm.

SD3948 (SWQAC 5)

SD3948 ((Briggs/FN1500-118) is an experimental hard red spring wheat breeding line developed by the South Dakota Agricultural Experiment Station. It was originally derived as a single plant from within an F₄ plant population created in fall 2000. SD3948 was tested within South Dakota State University Preliminary Yield Trials (2005) and Advanced Yield Trials (AYT) from 2006 through 2009. It was also tested in the Uniform Regional Spring Wheat Nursery (URN) during 2007 and 2008 as well as the South Dakota Crop Performance Testing (CPT) trials in 2007 through 2009. In addition, SD3948 was evaluated by the Wheat Quality Council in 2009. Pending approval of the SDSU Variety Review and Release Committee, SD3948 should be made available to Registered seed producers in spring 2010. Coverage under the United States Plant Variety Protection Act will be sought.

Points of note associated with SD3948 include:

- 1 Good yield potential
- 2 High test weight
- 3 Adequate grain protein concentration
- 4 Early heading date
- 5 A good level of Fusarium Head Blight (FHB) resistance
- 6 Resistant to moderately resistant ratings for both leaf and stem rust

B (SWQAC 6)

CHBRW3-269 is a hard red spring wheat, developed by World Wide Wheat LLC (W3), using male sterile facilitated recurrent selection (MSFRS) population breeding methodology. It originated as a single F2 head selection out of W3's Chilean nursery in 2002. Single head selection continued through the F4 generation. CHBRW3-269 has been tested in replicated yield trials since 2004 at several W3 global locations with much success. The line possesses a high-yielding potential under adequate moisture conditions. It is resistant to stripe rust, and found to be adapted to Arizona, California, Chilean and Argentinean environments.

ND810 (SWQAC 7)

ND810 is a hard red spring wheat (HRSW) wheat line selected from the PARSHALL/3/GR*2/RL4137//AMIDON cross. Parshall and Amidon are HRSW cultivars released by NDSU. Previous to the release of Glenn, Parshall was the WQC quality check for the spring wheat for many years. ND810 is adapted to most ND. However, it is recommended to western region where Reeder is grown. Overall, ND810 has high grain yield, better than most grown cultivars, particularly in the Western region. It is a conventional line (height); medium early (similar to Steele-ND and Alsen) and has medium to strong straw strength similar to Alsen. Protein of ND810 is very good similar to Steele-ND with good overall milling properties, particularly under western regions. Baking properties of ND810 is similar to Howard with average test weight similar to Alsen. ND810 has a good leaf diseases package wit medium susceptible/Medium resistant to scab similar (similar to Steele-ND) and highly resistant to leaf and stem rusts.

CA905-780 (SWQAC 8)

Brogan (Granite/Briggs) is a shorter (4-6 inches), better standing version of the outstanding South Dakota State University variety Briggs. In most other respects it is very similar to Briggs. However, Brogan is 2 – 3 days later to head and appears to be more susceptible to bacterial blight than Briggs. Brogan has been among the yield leaders in our trials for the last three years. Brogan is moderately resistant to leaf rust, resistant to stem rust and moderately susceptible to stripe rust. It is moderately resistant to foliar disease (tan spot and Septoria) and moderately susceptible to susceptible to Fusarium head blight. Brogan has medium high test weight and protein like Briggs with an average SDS Sedimentation value of 106 mm.

MN03196 (SWQAC 10)

MN03196 is a mid maturity hard red spring wheat with good straw strength, grain yields and moderate scab resistance. The pedigree of MN03196 is Alsen-1//Parshall/MN97665. MN03196 has been a consistently high yielder in Minnesota and the hard red spring wheat region, performing well in the 2007 and 2008 regional performance nurseries. Grain protein is average compared to other cultivars, but test weight is above average. MN03196 is resistant to pre-harvest sprouting based on our simulated rainfall testing. MN03196 is resistant to stem rust and prevalent races of leaf rust. MN03196 has moderate resistance to Fusarium head blight (scab), comparable to 'RB07'.

BZ903-504 (SWQAC 11)

WB-Digger (Reeder/Zeke) is a good standing, medium-early maturity, medium height, medium protein, stay-green, management wheat. WB-Digger appears to out-yield high-yielding Samson in environments where the extra height and staygreen is an advantage. WB-Digger is a complement to Samson not a replacement. WB-Digger is moderately resistant to moderately susceptible to leaf rust, stripe rust, stem rust and foliar disease (tan spot and Septoria) and is susceptible to Fusarium head blight. WB-Digger has medium protein and test weight with an average SDS sedimentation value of 109 mm.

ND808 (SWQAC 12)

SD4011 (SWQAC 13)

SD4011 (Briggs/SD3618) is an experimental hard red spring wheat breeding line developed by the South Dakota Agricultural Experiment Station. It was originally derived as a single plant from within an F_4 plant population created in fall 2001. SD4011 was tested within South Dakota State University Preliminary Yield Trials (2006) and Advanced Yield Trials (AYT) from 2007 through 2009. SD4011 was evaluated for the first time by the Wheat Quality Council in 2009 and will likely be submitted for consideration again in 2010. Pending approval of the SDSU Variety Review and Release Committee, SD4011 could be made available to Registered seed producers in spring 2011. Coverage under the United States Plant Variety Protection Act will be sought.

Points of note associated with SD4011 include:

- 1 Good yield potential
- 2 High grain protein concentration
- 3 Short plant stature
- 4 Resistant to moderately resistant ratings for both leaf and stem rust

CA905-781 (SWQAC 14)

Edge (Hank/Knudson) is a management wheat marketed exclusively by Sabre Seeds. Edge is a good standing, medium-early maturity, medium height, high yielding, fast-drying wheat that is great to straight combine. Edge is susceptible to leaf rust, moderately resistant to stem rust and moderately susceptible to stripe rust. It is susceptible to foliar disease (tan spot and Septoria) and Fusarium head blight. Edge has medium to medium-high test weight and protein with an average SDS Sedimentation value of 116 mm

Grain Cleaning and Milling Procedures

Wheat (approximately 6 bu/variety) was cleaned in a Carter-Day Bulldog seed cleaner that was equipped with two rotating indent cylinders (#24 – coarse and #16 fine), a sizer cylinder (#5), vibrator, and air aspiration. Sixty pounds of cleaned wheat was tempered to 16.5% moisture basis and conditioned 16-18 hours. The tempered wheat was milled in a Buhler Experimental Mill, MLU, at adjusted feed rates between 69 g/min and 125 g/min. Flour from three break (B1, B2, B3) and three reduction (R1, R2, R3) sections of the mill were combined to straight grade flour.

мант	imo for 60	0 lbs Tempe	rod Whoat	Feed Rate
Watertown	ID#	Minutes	Hours	g/min
MN03196	10	236	3.93	116
SD3948	5	247	4.12	110
01S0263-28	2	256	4.27	107
Glenn	9	258	4.30	106
SD4011	13	268	4.47	102
CA905-780	8	317	5.28	86
Casselton	-	-		
Glenn	9	222	3.70	123
ND810	7	239	3.98	114
MN03196	10	240	4.00	114
SD3948	5	254	4.23	107
ND808	12	269	4.48	101
CA905-776	4	291	4.85	94
ND811	3	314	5.23	87
01S0263-28	2	320	5.33	85
Crookston				
Glenn	9	226	3.77	121
ND810	7	233	3.88	117
MN03196	10	236	3.93	116
SD3948	5	247	4.12	110
ND808	12	260	4.33	105
ND811	3	307	5.12	89
Minot				
Glenn	9	233	3.88	117
MN03196	10	236	3.93	116
SD3948	5	241	4.02	113
BZ903-504	11	251	4.18	109
ND808	12	262	4.37	104
01S0263-28	2	318	5.30	86
ND811	3	321	5.35	85
В	6	325	5.42	84
Α	1	393	6.55	69
Williston				
Glenn	9	218	3.63	125
ND810	7	264	4.40	103
ND808	12	269	4.48	101
CA905-781	14	275	4.58	99
Α	1	304	5.07	90
В	6	329	5.48	83
ND811	3	342	5.70	80

The table illustrates the time and feed rate to mill 60 lbs of tempered wheat in the hard spring wheat configured Buhler mill. For each sample, feed rates were set to reduce caking of flour in the break and reduction sections and to maximize overall sieve efficiency. Low feed indicate rates poor milling efficiency of the sample.

Methods of Analyses

Wheat Market Value Score

Test Weight (AACC Method 55-10)

Wheat and Flour Protein (AACC46-30 - combustion method)

Wheat and Flour Ash (AACC Method 08-01)

Single Kernel Characterization System (hardness index)

Kernel Size (Sieving according to USDA/ARS WQL)

Wheat Falling Number (Perten Falling Number Instrument)

Vitreous Kernel Content (DHV analyses by FGIS grain testing service)

Flour Color (Minolta Colorimeter L* b* values)

Flour Extraction: % Total Product Basis (TPB), % Tempered Wheat Basis (TWB), and estimated Pounds of Straight Grade Flour/Bushel Wheat.

Farinograph

Water Absorption (Brabender Computerized Farinograph w/50 g bowl) - 14%mb and 500 bu.

Arrival Time: time required for the top of the curve to reach the 500 BU line after addition of water.

Peak Time: time between addition of water and development of the maximum consistency of the dough

Stability: difference in time between the point at which the top of the curve first intercepts the 500 BU line (arrival time) and the point at which the top of the curve leaves the 500 BU line (departure time).

Mechanical Tolerance Index (MTI): difference in BU between the top of the curve at the peak and the top of the curve measured 5 min after the peak is reached.

Time to Breakdown (TTB): time from the start of mixing to the time at which consistency has decreased 30 BU from the peak point.

Mixograph

Bake Cooperator Results/Evaluation: Bake Absorption (Actual - %) Loaf Volume (% of Check) Mixing Requirement Dough Characteristics Mixing Tolerance Internal Crumb Color Internal Crumb Grain and Texture

Bake Cooperator Quality Assessment: Protein Content Milling Baking Overall Comparison

Test Bake Procedures

Samples of flour were shipped to the following cooperators for evaluation of baking properties. The flour had been uniformly malted to a falling number of approximately 250 sec. Bleach was not added to the flour. Each cooperator test baked the flour according to their standard method using either straight dough, sponge and dough, or other test bake method. Cooperator data were returned to the WQL for compilation of results.

Bake Cooperators

ADM Milling	Olathe, Kansas
Bay State Milling Company	Winona, Minnesota
Cargill (Horizon Milling)	Minnetonka, Minnesota
Cereal Food Processors, Inc.	Wichita, Kansas
General Mills, Inc	Minneapolis, Minnesota
Wheat Marketing Center	Portland, Oregon
North Dakota State Mill	Grand Forks, North Dakota
North Dakota State University	
Department of Cereal Science	Fargo, North Dakota
USDA/ARS Grain Marketing &	
Production Research Center	Manhattan, Kansas
USDA/ARS Hard Red Spring & Durum	
Wheat Quality Laboratory	Fargo, North Dakota

2009 Spring Wheat Field Production Data

Notes on production as relates to climatic conditions, disease (scab etc.) that could affect grain quality.

Waterto	wn Casselton	Crookston	Minot	Williston
At Planting The plots w planted in c moist soils v good seed t contact.	oolwere near normalwithalthough it was much	The 2009 Spring Wheat Quality Trial was planted into some of our lighter soil. The soil conditions were moist at planting and made for an excellent seed bed.	record snowfall over the 08/09 winter. This led to a late start on planting of all crops in the area. At planting we had	Ideal soil conditions at planting. Good moisture.
During Growth				
Extremely h winds in ea stages.	5	Unusually cool growing season for the 2009 wheat crop.	Our whole growing season was condusive to growing cereal crops. We had adequate moisture and cool conditions all summer. The plant were not stressed during growth. Weed control was done in a timely fashion, thus the	We became dry after seeding. The plants were stressed. Some tillers burnt off due to the lack of moisture
At Flowering				
Frequent ra during flow causing mo head scab i fields.	ering mornings were the derate norm. Light to no	Bacterial leaf stripe was observed.	Cool conditions and no shortage of soil moisture made for good conditions for the wheat plants. There was no hot weather during flowering, this led to good seed set. It should be noted that with the cool	Cooler temperatures. Adequate moisture. The crop needed more heat units.
During Maturation				
Multiple sho after physio maturity rec color and te weight.	logical monthly temp and ducing higher than average	Because of the cool temperatures, ripening was a slow process.	Our cool wet conditions continued through harvest. This did lead to some harvest difficulties with the trial receiving some rain on the mature grain. There was some seed bleaching, but no sprout issues.	Cooler temperatures. Dry conditions.
At Harvest	The second	These		
Dry at harve	est. This late in the season we lacked the good drying days to get the grain moisture down to a good level. Therefore the harvest was undertaken at approximately 15% moisture.	There were no problems at harvest other than waiting till the crop matured.	Once the material dried from the rains we experianced there were no other harvest difficulties. The avg harvest moisture was 12.5 %.	Dry and cooler conditions.

Location							
Variable	Watertown	Casselton	Crookston	Minot	Williston		
Planting Date	4/28/2009	5/24/2009	5/8/2009	6/2/2009	5/19/2009		
Harvest Date	8/27/2009	9/21/2009	9/3/2009	9/29/2009	9/9/2009		
Fertilizer (lb/A)			- -	·			
Ν	162	155	17 + 126	150 lbs Urea	100 lb/ac		
Р	140	25	14	30 lbs 11-52-0	0		
K	360	0	286	-	0		
Herbicide/rate			-				
Broadleaf	Bronate Ultra/ 1.2 Pt.,6/1/09	.8 pt Bison Advanced	Bronate/1 pt/A	12oz/ac. Huskie/.2oz Harmony GT	Bronate/1 pt/A		
Grass	-	.5 pt Puma	Puma/1/2 pt/A	.66 pt Puma	.5 pt Puma		
Fungicide	Folicur/4 oz., 7/1/09	none	-	3 oz. Headline at Herb app.	-		

Climatologic Data						
Month	Average Temperature (⁰ F)/Precipitation (in)					
	Watertown	Casselton	Crookston	Minot	Williston	
April	-	33.6 /1.15	41.0/0.88	47.3/1.12	42/1.55	
May	55/1.55	53 /1.77	51.7/2.50	63.35/1.51	54/0.61	
June	63/2.98	63.5 /2.65	62.6/4.55	71.8/1.97	62/1.49	
July	66/3.78	67 /1.26	65.3/3.43	74.9/1.52	66/2.55	
August	66.5/3.07	65.7/2.72	64.4/3.2	75.7/1.8	66/0.27	
September	-	64/ 2.35	-	76.0/3.95	-	

Yield Data							
Cultivar	Yield (bu/acre) / Test Wt / % Moisture						
	Watertown	Casselton	Crookston	Minot	Williston		
SWQAC 1	*	*	*	**	**		
SWQAC 2	51.8/59.5/12.7	57.5/**/**	*	**	*		
SWQAC 3	*	62.8/**/**	52/60/14.93	**	**		
SWQAC 4	*	66.4/**/**	*	*	*		
SWQAC 5	60.6/60.3/12.9	68/**/**	60/61/15.34	**	*		
SWQAC 6	*	*	*	**	**		
SWQAC 7	*	58/**/**	63/60/14.52	**	**		
SWQAC 8	33.8/58.3/12.5	*	*	*	*		
SWQAC 9	45.2/59.9/12.7	53/**/**	57/61/14.93	**	**		
SWQAC 10	44.3/60.1/12.9	61.7/**/**	60/62/15.13	**	*		
SWQAC 11	*	*	*	**	*		
SWQAC 12	*	53.8/**/**	66/61/14.52	**	**		
SWQAC 13	42.6/57.6/12.5	*	*	*	*		
SWQAC 14	*	*	*	*	**		

* Not Increased at this site ** = No data available

Wheat Marketing Score

The development of a Wheat Marketing Score (WMS) or Export Marketing Score was discussed at the Hard Spring Wheat planning meeting in March, 2004. The purpose for developing a WMS was to facilitate a better understanding of wheat quality in marketing systems. Two WMS methods were developed and tested. For each method, the quality variables of TW, 1000 KWT, FN, Wheat Protein, and Wheat Ash were incorporated for calculating the WMS. Method #1 was developed on a scale of 0 to 6 where the Glenn Check was evaluated along with the experimental lines for each growing location. Method #2 was developed on a scale of 0 to 10 where the experimental lines were evaluated against the Glenn Check for each growing location.

Wheat Marketing Score – Method #1

WHEAT MARKETING SCORE or EXPORT MARKETING SCORE								
		Test Weight	1000 KWT	Falling Number	Wheat Protein	Wheat Ash		
Variation(+/-) from Target Value: S ^o	CORE	1lb/bu	3 g up, 4 g down	25 sec	1.0%	0.1%		
	6	63 lb/bu	39 g	425 sec	16.5%	1.35%		
	5	62 lb/bu	36 g	400 sec	15.5%	1.45%		
	4	61 lb/bu	33g	375 sec	14.5%	1.55%		
TARGET VALUE:		60 lb/bu	30 g	350 sec	13.5%	1.65%		
	2	59 lb/bu	26 g	325 sec	12.5%	1.75%		
	1	58 lb/bu	22 g	300 sec	11.5%	1.85%		
	0	57 lb/bu	18 g	275 sec	10.5%	1.95%		

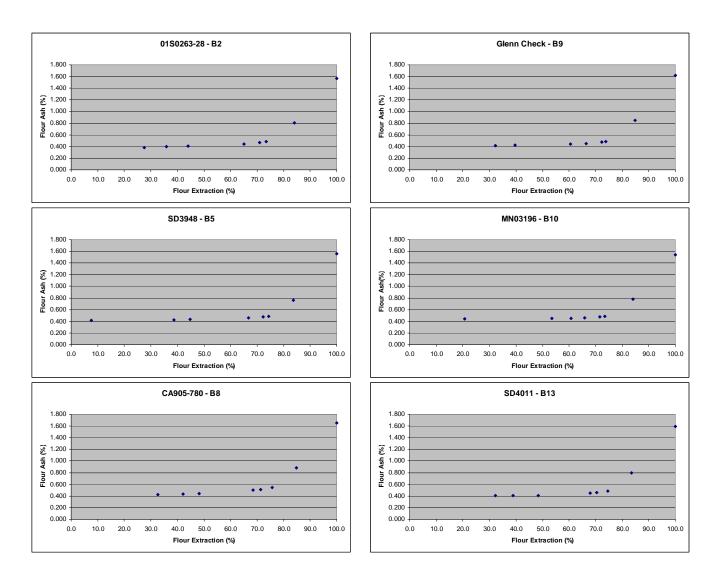
Wheat Marketing Score = (TW*2) + (1000KWT*2) + (FN*2) + (Protein*3) + (Ash*1)/10

Wheat Marketing Score – Method

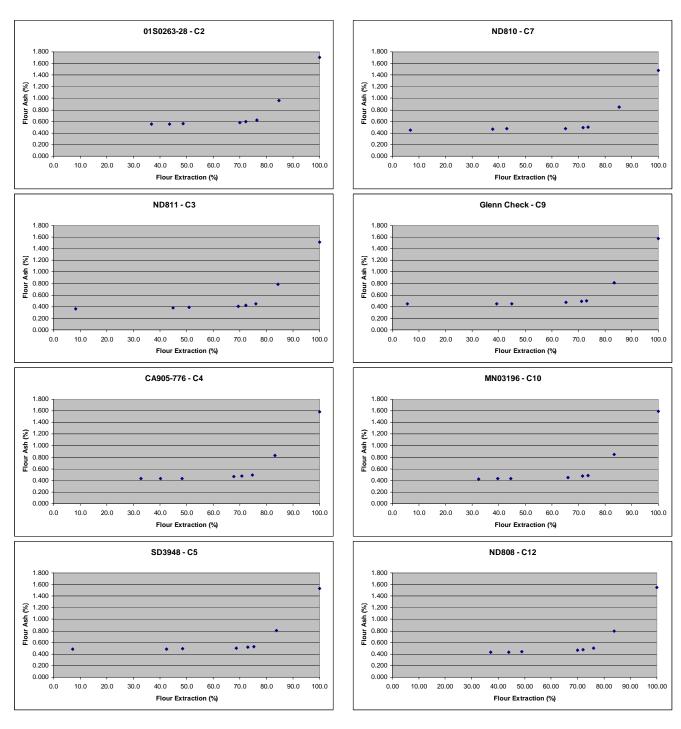
Rules for Score Calculation

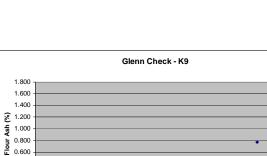
Weight of each Factor		Weighting					
Protein		0.3					
Test Weight (TW)		0.2					
Falling Number		0.2					
Thousand Kernel Weight (TKW)		0.2					
Wheat Ash		0.1					
		Entered Line minus	s Check value equ	als difference (D	iff)		
Component Score	0	2	4	6	8		
Protein	Diff<-2.5	-2.501 <diff<-2< td=""><td>-2.001<diff<-1.5< td=""><td>-1.501<diff<-1< td=""><td>-1.001<diff<-0.5< td=""><td></td><td></td></diff<-0.5<></td></diff<-1<></td></diff<-1.5<></td></diff<-2<>	-2.001 <diff<-1.5< td=""><td>-1.501<diff<-1< td=""><td>-1.001<diff<-0.5< td=""><td></td><td></td></diff<-0.5<></td></diff<-1<></td></diff<-1.5<>	-1.501 <diff<-1< td=""><td>-1.001<diff<-0.5< td=""><td></td><td></td></diff<-0.5<></td></diff<-1<>	-1.001 <diff<-0.5< td=""><td></td><td></td></diff<-0.5<>		
TestWeight	Diff<-5	-5.001 <diff<-4< td=""><td>-4.001<diff<-3< td=""><td>-3.001<diff<-2< td=""><td>-2.001<diff<-1< td=""><td></td><td></td></diff<-1<></td></diff<-2<></td></diff<-3<></td></diff<-4<>	-4.001 <diff<-3< td=""><td>-3.001<diff<-2< td=""><td>-2.001<diff<-1< td=""><td></td><td></td></diff<-1<></td></diff<-2<></td></diff<-3<>	-3.001 <diff<-2< td=""><td>-2.001<diff<-1< td=""><td></td><td></td></diff<-1<></td></diff<-2<>	-2.001 <diff<-1< td=""><td></td><td></td></diff<-1<>		
Falling Number	Diff<-125	-125.01 <diff<-100< td=""><td>-100.01<diff<75< td=""><td>-75.01<diff<50< td=""><td>-50.01<diff<-25< td=""><td></td><td></td></diff<-25<></td></diff<50<></td></diff<75<></td></diff<-100<>	-100.01 <diff<75< td=""><td>-75.01<diff<50< td=""><td>-50.01<diff<-25< td=""><td></td><td></td></diff<-25<></td></diff<50<></td></diff<75<>	-75.01 <diff<50< td=""><td>-50.01<diff<-25< td=""><td></td><td></td></diff<-25<></td></diff<50<>	-50.01 <diff<-25< td=""><td></td><td></td></diff<-25<>		
Thousand Kernel Weight	Diff<-10	-10.001 <diff<-8< td=""><td>-8.001<diff<-6< td=""><td>-6.001<diff<-4< td=""><td>-4.001<diff<-2< td=""><td></td><td></td></diff<-2<></td></diff<-4<></td></diff<-6<></td></diff<-8<>	-8.001 <diff<-6< td=""><td>-6.001<diff<-4< td=""><td>-4.001<diff<-2< td=""><td></td><td></td></diff<-2<></td></diff<-4<></td></diff<-6<>	-6.001 <diff<-4< td=""><td>-4.001<diff<-2< td=""><td></td><td></td></diff<-2<></td></diff<-4<>	-4.001 <diff<-2< td=""><td></td><td></td></diff<-2<>		
Wheat Ash							
Component Score	10	8	6	4	2		0
Protein	-0.501 <d< td=""><td>i 2<diff<3.001< td=""><td>3<diff<4.001< td=""><td>4<diff<5.001< td=""><td>5<diff<6.001< td=""><td>Diff>6</td><td></td></diff<6.001<></td></diff<5.001<></td></diff<4.001<></td></diff<3.001<></td></d<>	i 2 <diff<3.001< td=""><td>3<diff<4.001< td=""><td>4<diff<5.001< td=""><td>5<diff<6.001< td=""><td>Diff>6</td><td></td></diff<6.001<></td></diff<5.001<></td></diff<4.001<></td></diff<3.001<>	3 <diff<4.001< td=""><td>4<diff<5.001< td=""><td>5<diff<6.001< td=""><td>Diff>6</td><td></td></diff<6.001<></td></diff<5.001<></td></diff<4.001<>	4 <diff<5.001< td=""><td>5<diff<6.001< td=""><td>Diff>6</td><td></td></diff<6.001<></td></diff<5.001<>	5 <diff<6.001< td=""><td>Diff>6</td><td></td></diff<6.001<>	Diff>6	
TestWeight	-1.001 <d< td=""><td>i 2<diff<4.001< td=""><td>4<diff<6.001< td=""><td>6<diff<8.001< td=""><td>8<diff<10.001< td=""><td>Diff>10</td><td></td></diff<10.001<></td></diff<8.001<></td></diff<6.001<></td></diff<4.001<></td></d<>	i 2 <diff<4.001< td=""><td>4<diff<6.001< td=""><td>6<diff<8.001< td=""><td>8<diff<10.001< td=""><td>Diff>10</td><td></td></diff<10.001<></td></diff<8.001<></td></diff<6.001<></td></diff<4.001<>	4 <diff<6.001< td=""><td>6<diff<8.001< td=""><td>8<diff<10.001< td=""><td>Diff>10</td><td></td></diff<10.001<></td></diff<8.001<></td></diff<6.001<>	6 <diff<8.001< td=""><td>8<diff<10.001< td=""><td>Diff>10</td><td></td></diff<10.001<></td></diff<8.001<>	8 <diff<10.001< td=""><td>Diff>10</td><td></td></diff<10.001<>	Diff>10	
Falling Number	-25.01 <d< td=""><td>iff</td><td></td><td></td><td></td><td></td><td></td></d<>	iff					
Thousand Kernel Weight	-2.001 <d< td=""><td>i 4<diff<8.001< td=""><td>8<diff<12.001< td=""><td>12<diff<16.001< td=""><td>16<diff<20.001< td=""><td>Diff>20</td><td></td></diff<20.001<></td></diff<16.001<></td></diff<12.001<></td></diff<8.001<></td></d<>	i 4 <diff<8.001< td=""><td>8<diff<12.001< td=""><td>12<diff<16.001< td=""><td>16<diff<20.001< td=""><td>Diff>20</td><td></td></diff<20.001<></td></diff<16.001<></td></diff<12.001<></td></diff<8.001<>	8 <diff<12.001< td=""><td>12<diff<16.001< td=""><td>16<diff<20.001< td=""><td>Diff>20</td><td></td></diff<20.001<></td></diff<16.001<></td></diff<12.001<>	12 <diff<16.001< td=""><td>16<diff<20.001< td=""><td>Diff>20</td><td></td></diff<20.001<></td></diff<16.001<>	16 <diff<20.001< td=""><td>Diff>20</td><td></td></diff<20.001<>	Diff>20	
Wheat Ash	Diff<0.10 ⁻	10.1 <diff<0.201< td=""><td>0.2<diff<0.301< td=""><td>0.3<diff<0.401< td=""><td>0.4<diff<0.501< td=""><td>Diff>0.5</td><td></td></diff<0.501<></td></diff<0.401<></td></diff<0.301<></td></diff<0.201<>	0.2 <diff<0.301< td=""><td>0.3<diff<0.401< td=""><td>0.4<diff<0.501< td=""><td>Diff>0.5</td><td></td></diff<0.501<></td></diff<0.401<></td></diff<0.301<>	0.3 <diff<0.401< td=""><td>0.4<diff<0.501< td=""><td>Diff>0.5</td><td></td></diff<0.501<></td></diff<0.401<>	0.4 <diff<0.501< td=""><td>Diff>0.5</td><td></td></diff<0.501<>	Diff>0.5	

Cumulative Ash Curves - Watertown, SD



Cumulative Ash Curves – Casselton, ND





• •

0.400 ·

0.200

0.000

Cumulative Ash Curves - Crookston, MN

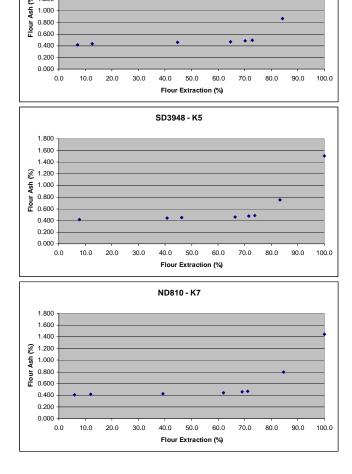
ND811 - K3

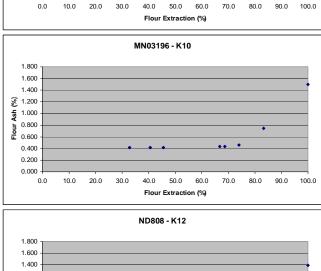
1.800

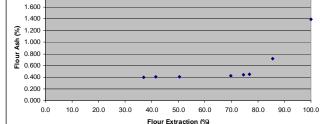
1.600

1.400

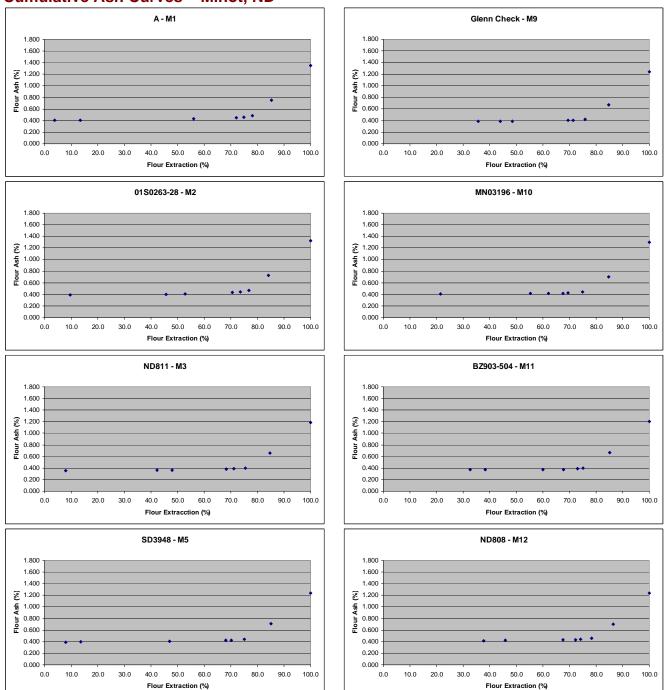
දි 1.200

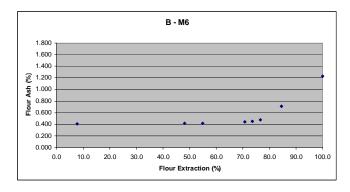


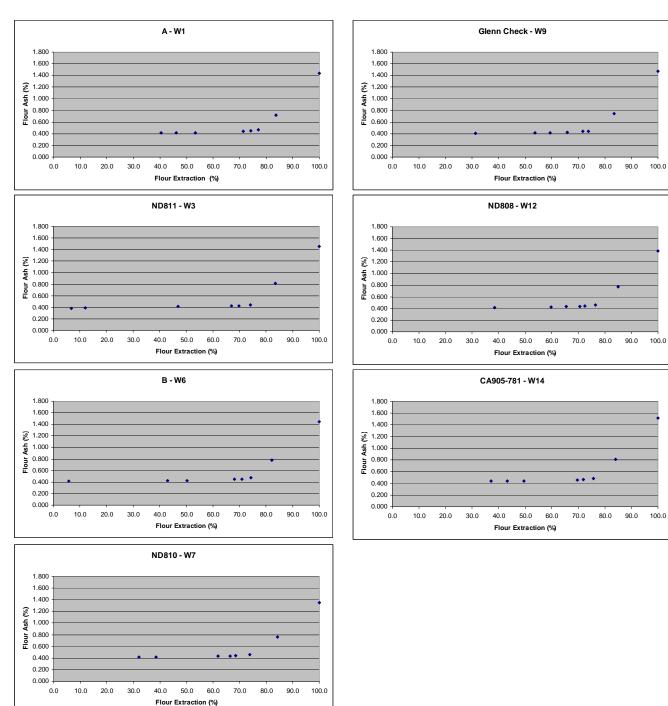




Cumulative Ash Curves – Minot, ND



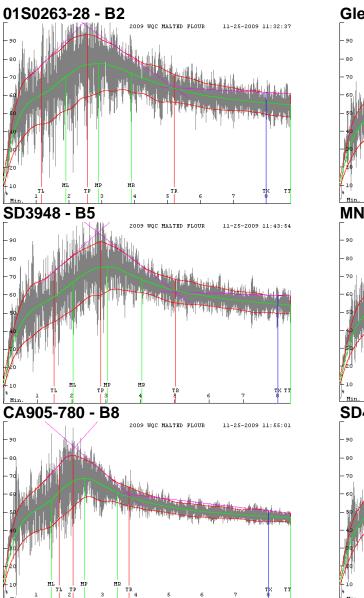


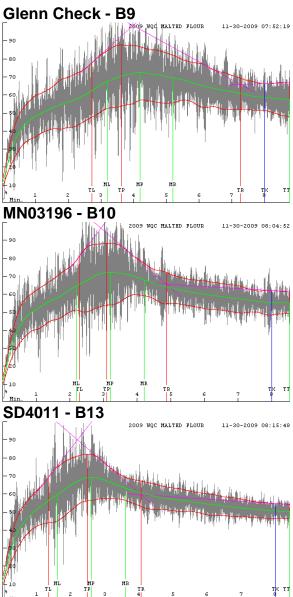


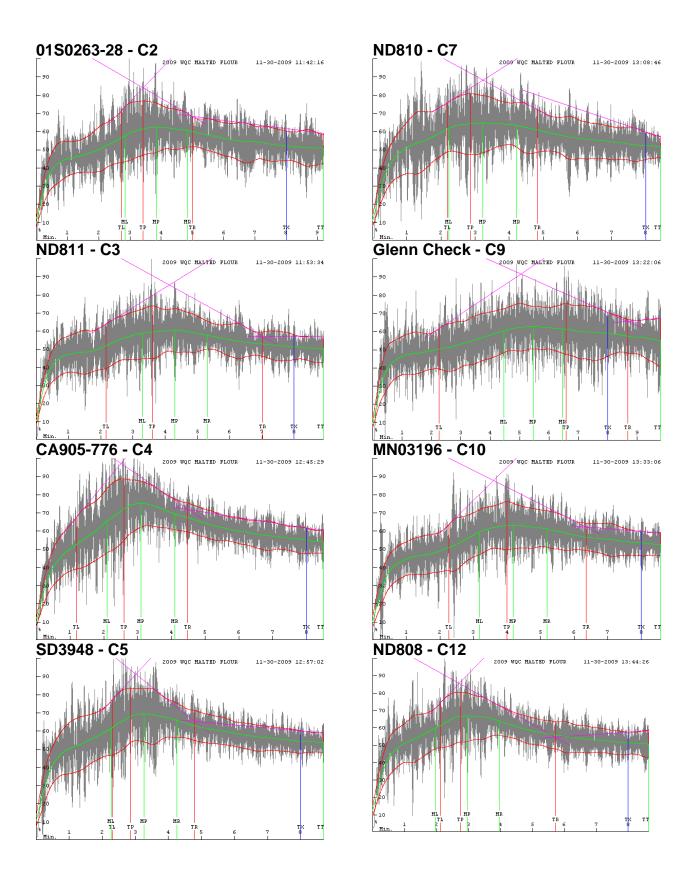
Cumulative Ash Curves – Williston, ND

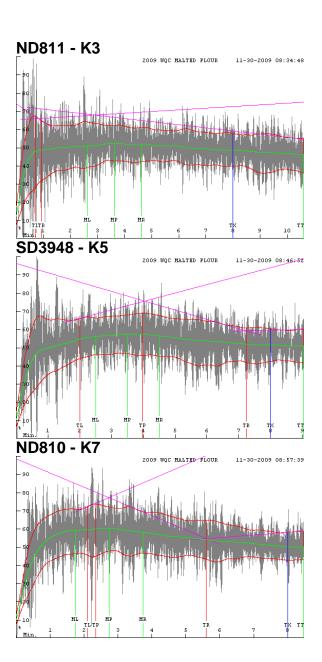
66

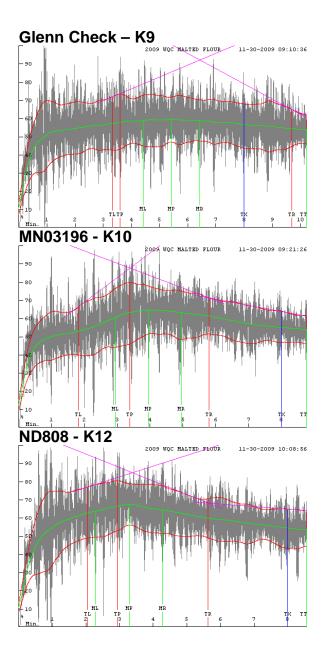
Mixograms

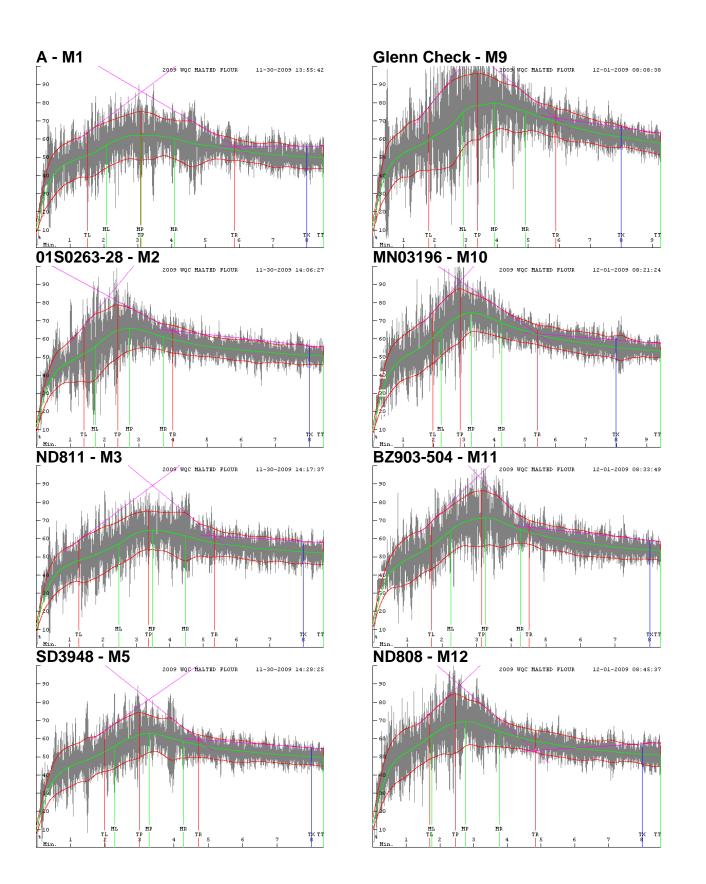


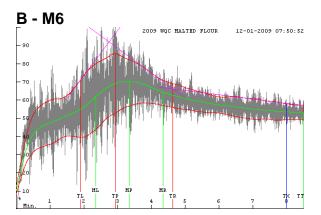


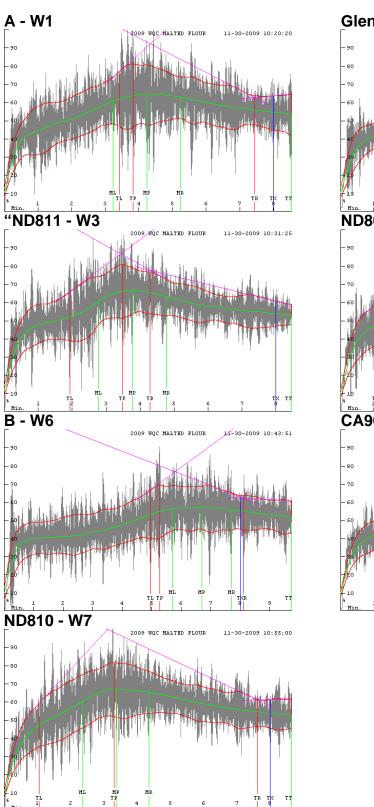


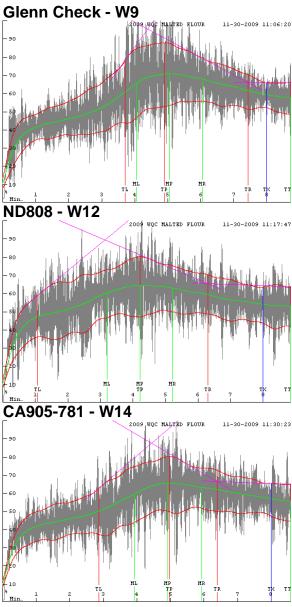


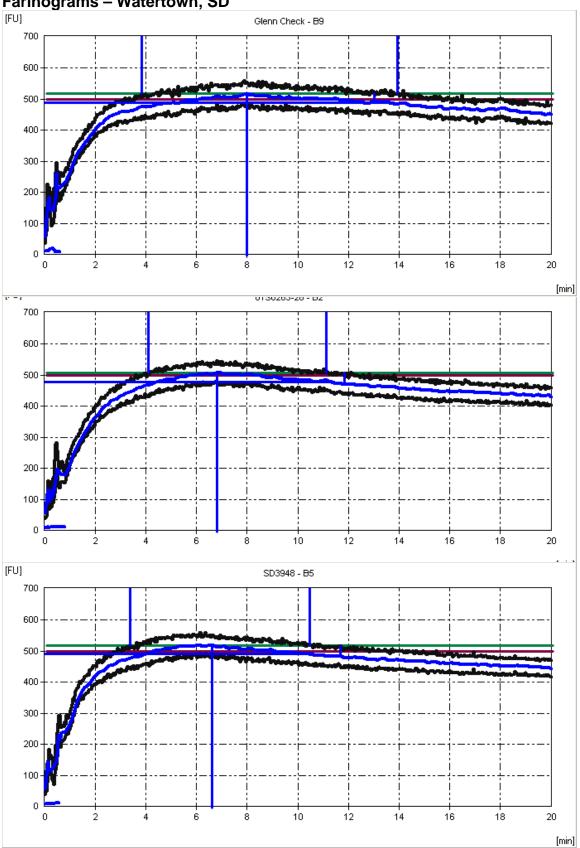




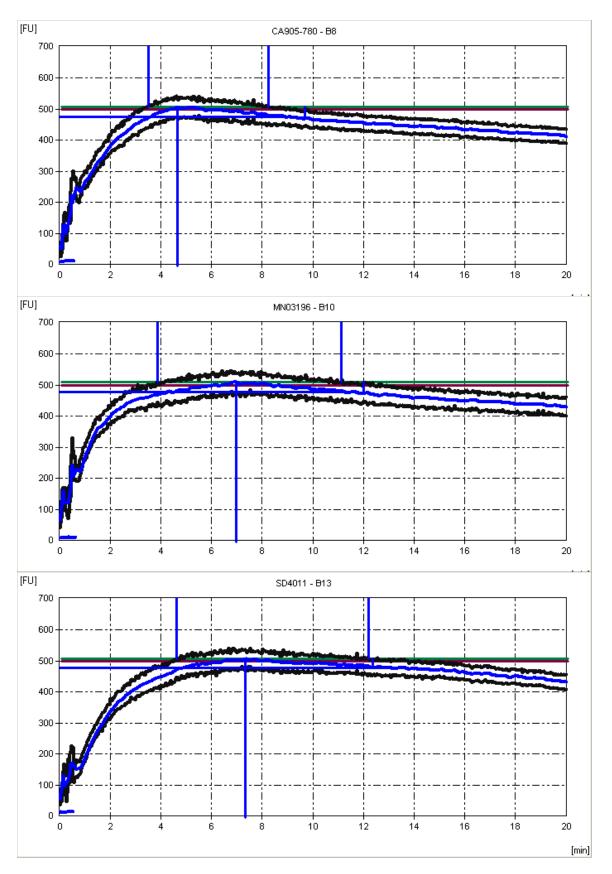


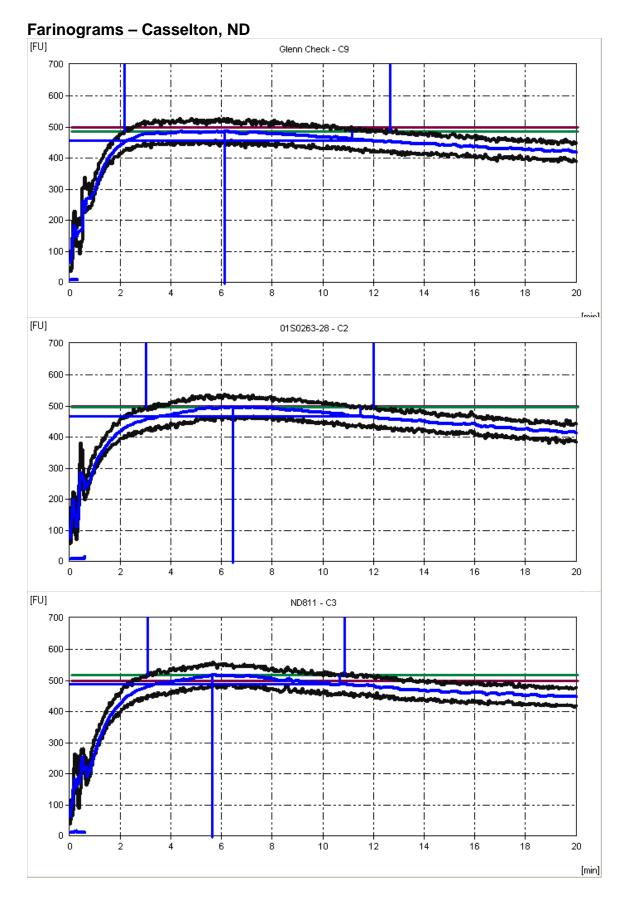


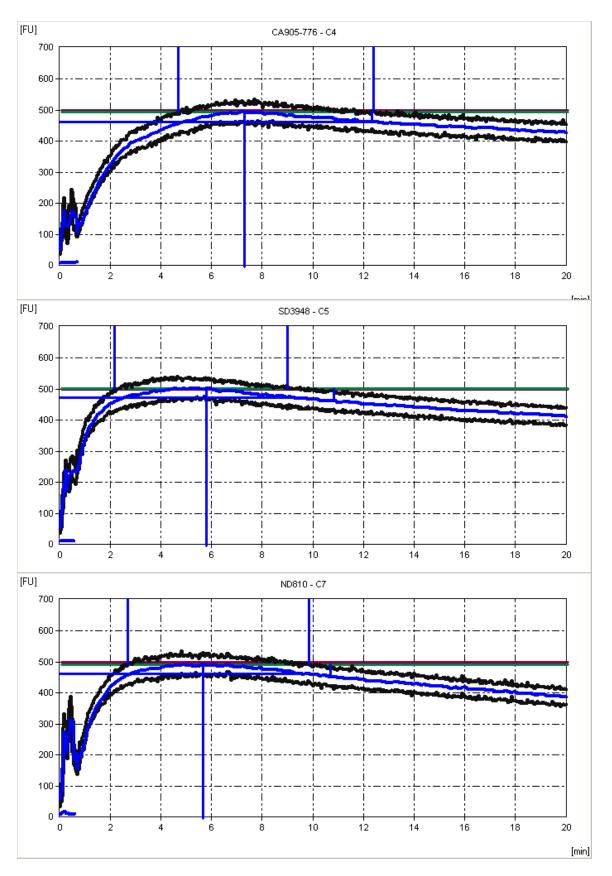


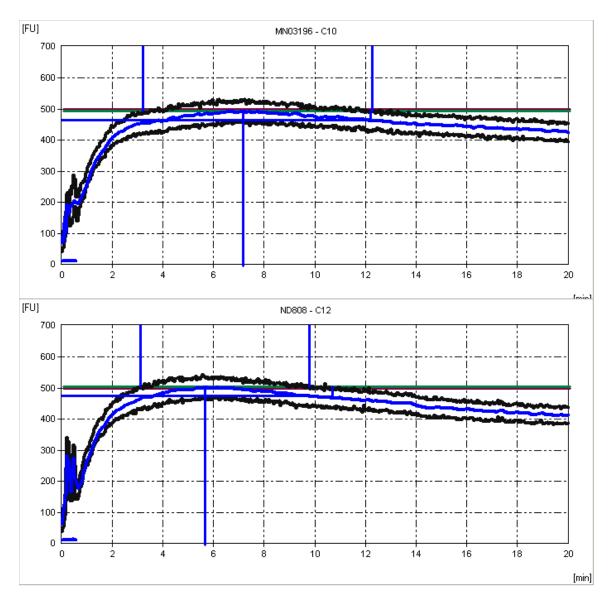


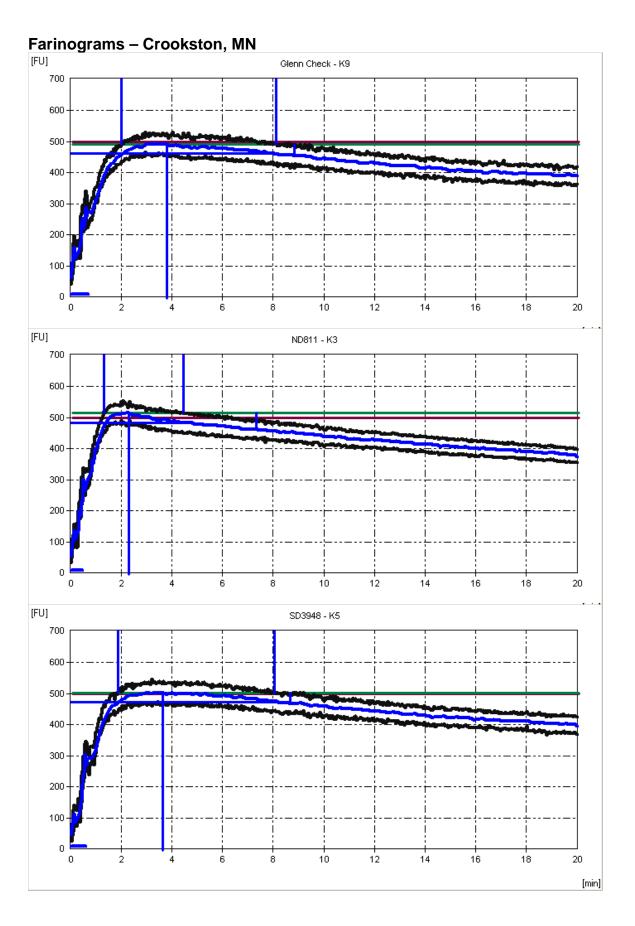
Farinograms – Watertown, SD

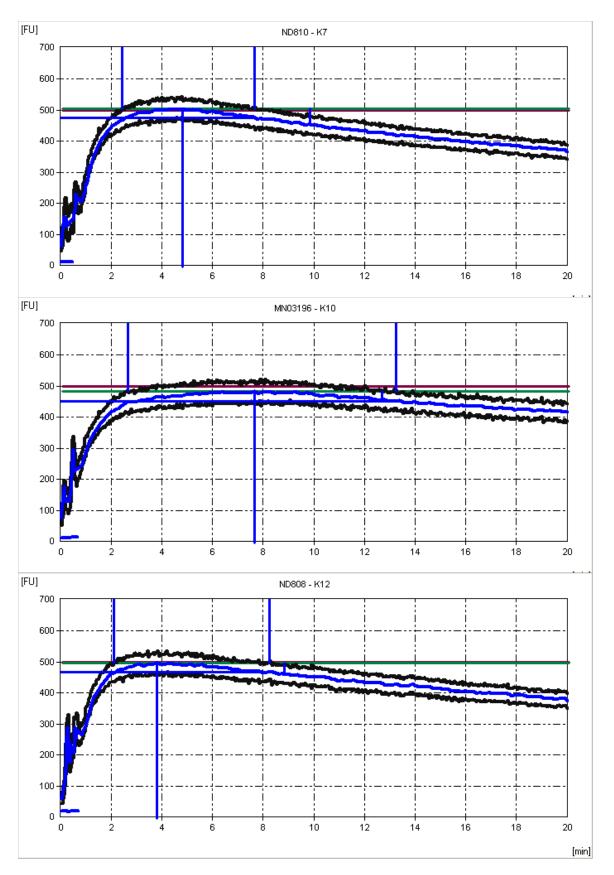


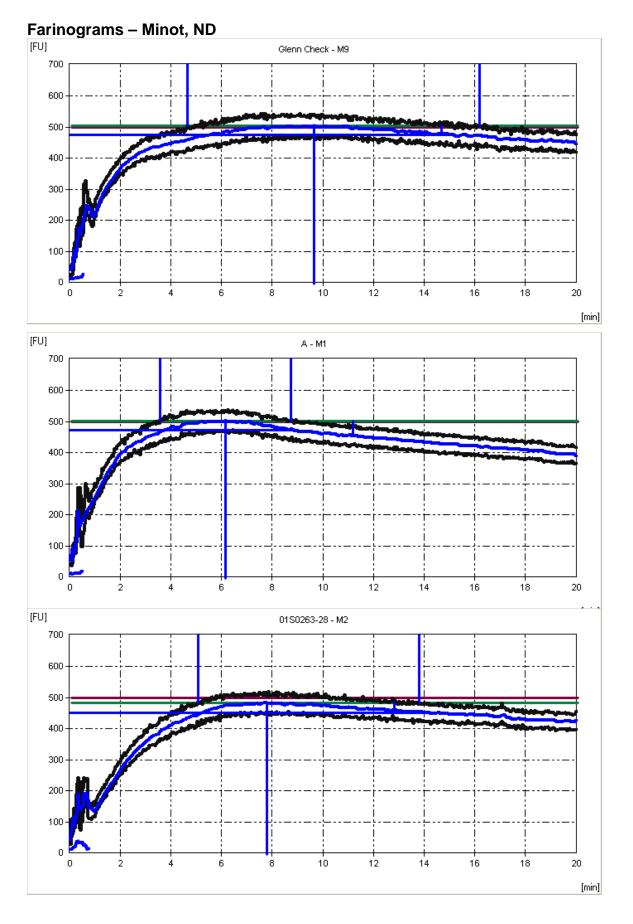


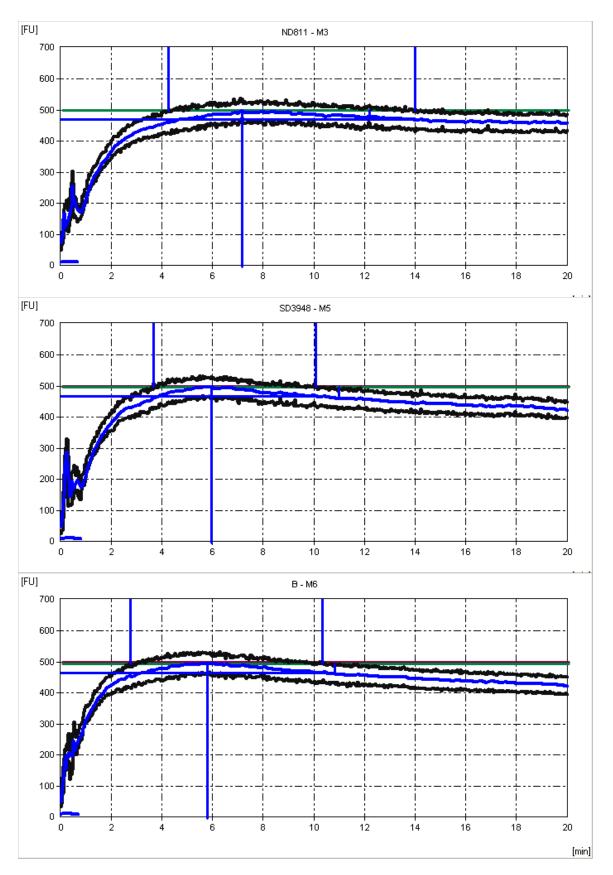


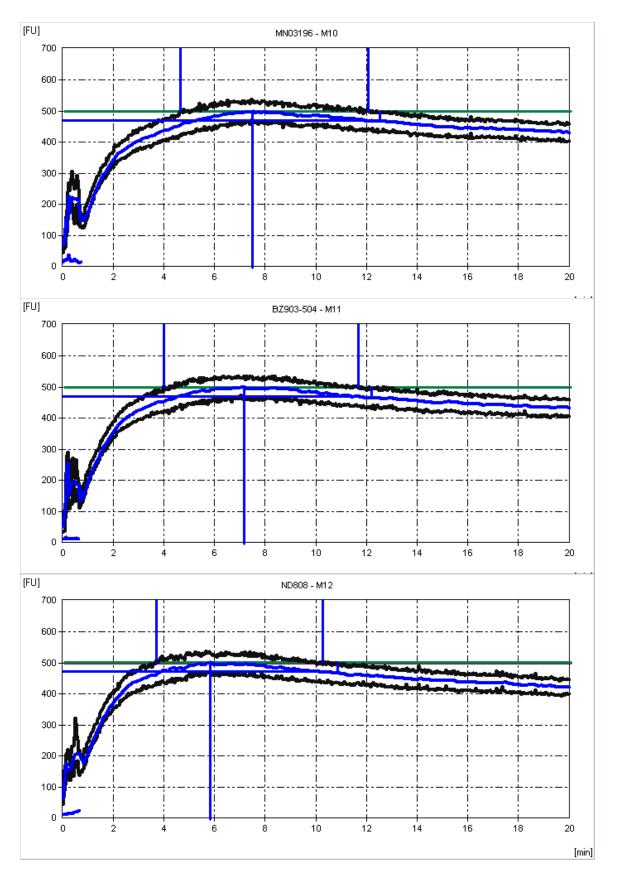


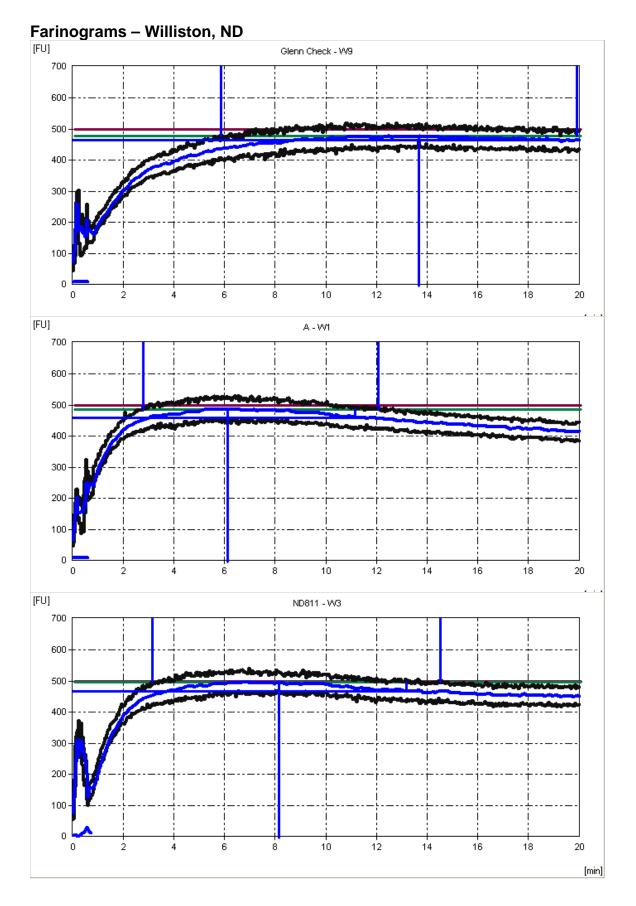




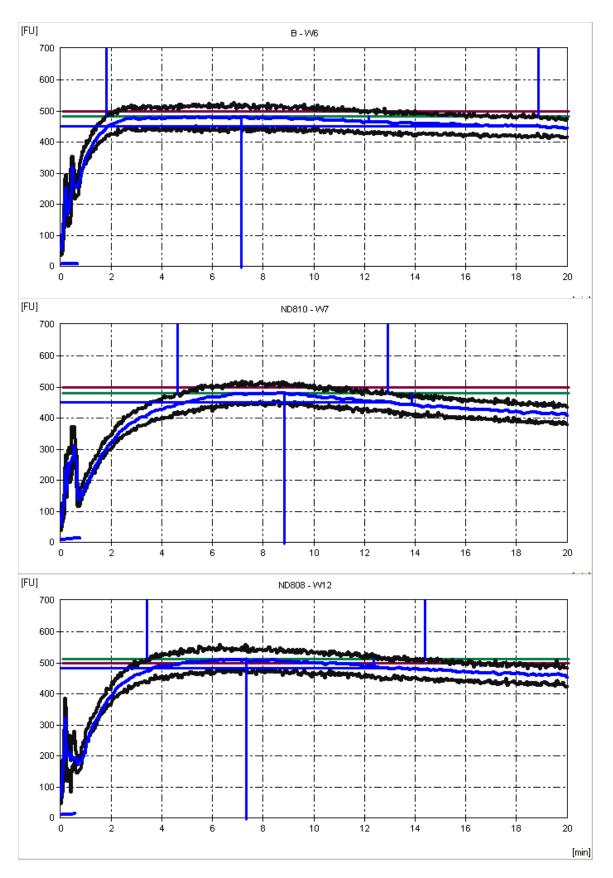


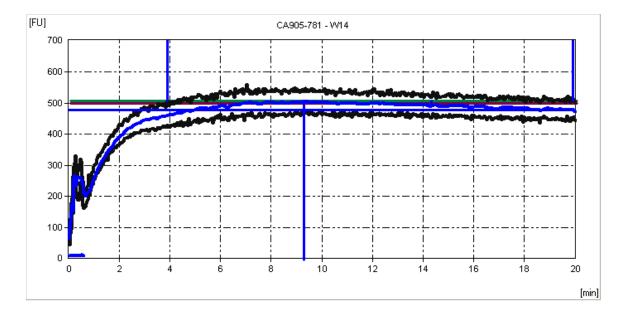


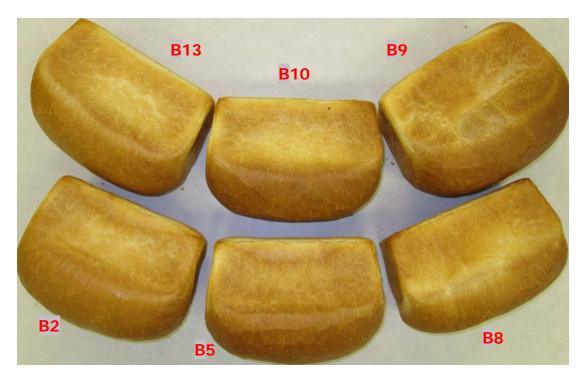








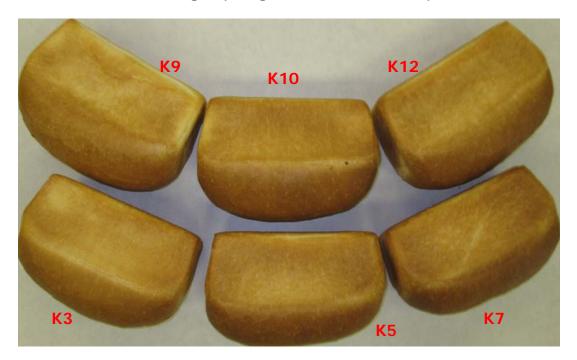




Watertown – Bread Images (100 g loaves – USDA/WQL)



Casselton - Bread Images (100 g loaves – USDA/WQL)



Crookston - Bread Images (100 g loaves – USDA/WQL)



Minot - Bread Images (100 g loaves – USDA/WQL)



Williston - Bread Images (100 g loaves – USDA/WQL)

2009 Kernel Characteristics by Location

	Wheat	Flour	Wheat		Test	Kernel	Kernel Size		Wheat	Wheat	Falling	SKCS	Vitreous
_	Protein	Protein		t Score	Weight	Weight	large	small	Moisture	Ash	Number	Hardness	Kernels
Entry	12%mb	12%mb	1 to 6	1 to 10	lb/bu	g/1000	(g)	(g)	%	14%mb	sec	Index	%
Watertown (B)													
01S0263-28	14.8	14.4	4.4	8.6	62.2	33.4	75	5	10.7	1.58	457	77.8	59.3
SD3948	14.6	14.3	4.6	9	62.0	35.7	81	4	10.8	1.51	453	83.6	65.0
CA905-780	15.1	14.5	4.2	8.8	60.2	33.9	69	5	10.5	1.60	623	67.9	57.6
Glenn	15.5	15.2	4.8	10	63.3	35.6	79	3	10.8	1.57	400	83.7	92.0
MN03196	14.8	14.6	4.6	9	62.6	33.1	71	7	10.2	1.54	445	89.6	82.7
SD4011	15.5	15.2	4.2	8.8	59.8	34.1	76	4	10.5	1.53	447	71.4	62.3
Casselton (C)													
01S0263-28	13.6	13.3	3.0	7.8	59.7	29.6	46	11	9.8	1.59	371	87.4	65.6
ND811	13.9	13.5	4.2	8.6	62.0	32.8	77	5	10.9	1.40	454	78.8	65.6
CA905-776	14.4	13.9	3.5	8.8	61.4	29.5	55	8	10.1	1.52	380	74.2	58.4
SD3948	13.7	13.2	3.9	9	61.8	32.2	65	5	10.3	1.48	417	83.0	41.6
ND810	14.4	13.7	4.1	9.6	61.7	28.6	49	9	9.6	1.47	479	81.8	61.4
Glenn	14.5	14.0	4.2	10	63.6	28.3	47	9	10.2	1.54	418	88.6	90.2
MN03196	14.3	13.7	4.1	9.6	62.1	28.8	53	10	9.6	1.57	461	85.1	82.8
ND808	14.3	13.8	4.0	8.8	60.6	33.4	70	6	9.6	1.51	460	79.7	57.2
Crookston (K)													
ND811	11.1	10.3	3.0	6.2	62.3	36.0	83	3	9.6	1.49	322	83.1	51.5
SD3948	13.1	12.4	4.2	8.4	63.2	35.7	81	3	9.6	1.46	399	81.0	54.5
ND810	13.9	13.0	4.3	9.6	63.0	32.1	71	5	9.3	1.41	431	87.0	50.7
Glenn	14.1	13.3	3.7	10	64.5	33.4	71	4	9.7	1.47	312	87.5	91.2
MN03196	13.8	13.4	4.1	9.6	64.0	30.8	57	9	9.6	1.38	406	87.9	82.6
ND808	12.2	11.7	3.9	7.4	63.0	37.7	87	3	9.7	1.31	336	76.0	92.4
Minot (M)													
A	13.7	12.9	3.5	7.4	59.1	33.1	74	3	10.6	1.33	384	73.1	14.2
01S0263-28	14.7	14.2	4.0	9	61.0	29.7	57	8	9.6	1.30	396	64.7	5.4
ND811	14.0	13.5	4.0	8.6	60.1	34.0	43	5	10.6	1.15	421	74.0	27.3
SD3948	14.8	14.0	4.5	10	61.9	34.8	78	3	10.6	1.19	405	74.3	11.4
В	12.8	11.8	3.4	6.4	59.8	29.6	46	10	10.1	1.17	407	66.2	6.7
Glenn	14.8	14.7	4.4	10	62.8	32.5	68	5	10.1	1.19	388	72.7	71.0
MN03196	14.3	13.6	4.3	9.4	62.3	33.3	67	7	10.4	1.24	410	78.7	67.2
BZ903-504	14.4	13.5	4.1	8.8	60.4	37.9	81	3	10.4	1.19	391	70.4	53.6
ND808	13.9	13.1	4.0	8.2	60.6	39.2	83	3	9.9	1.18	373	67.5	10.8
Williston (W)													
Α	13.3	12.7	3.4	5.8	58.6	27.8	55	7	9.7	1.39	579	70.4	26.0
ND811	14.4	14.0	3.9	7.4	59.9	29.0	47	8	10.0	1.38	479	77.3	88.4
В	12.9	12.0	3.4	6.2	59.4	26.8	25	13	9.7	1.36	495	61.2	7.5
ND810	14.5	14.0	3.9	7	60.2	25.7	22	17	9.8	1.33	477	81.7	89.1
Glenn	16.6	15.9	4.8	10	62.4	28.4	27	11	9.4	1.44	464	76.6	98.0
ND808	15.3	14.7	4.0	8.2	58.7	30.3	47	9	9.5	1.35	466	73.7	80.0
CA905-781	16.2	15.5	4.2	8.8	59.4	31.7	50	8	9.8	1.46	479	62.8	82.1
04303-101	10.2	15.5	4.2	0.0	55.4	51.7	50	0	5.0	1.40	413	02.0	02.1

Flour Characteristics by Location

	_	Flour Extraction				Flour	Flour	Flour FN	
	TWB	TWB TPB Flour/bu wheat		Flour Color		Moisture	Ash	Malted	
Entry	%	%	Lbs	L*	b*	%	14%mb	sec	
Watertown (B)									
01S0263-28	70.1	73.5	45.7	89.7	10.3	13.1	0.529	251	
SD3948	71.5	74.5	46.7	90.0	9.0	13.6	0.516	252	
CA905-780	72.7	75.6	45.8	89.9	8.7	13.3	0.579	252	
Glenn	69.9	73.7	46.2	89.8	8.2	13.3	0.518	251	
MN03196	70.0	73.5	45.9	89.7	8.6	13.2	0.539	258	
SD4011	72.3	74.5	45.3	89.8	8.3	12.9	0.507	257	
Casselton (C)									
01S0263-28	72.4	76.3	45.9	89.1	10.3	12.5	0.615	258	
ND811	72.4	76.0	46.9	89.7	9.2	13.0	0.499	256	
CA905-776	70.9	74.7	45.9	89.5	10.7	12.6	0.530	254	
SD3948	71.9	75.2	46.7	89.3	9.2	13.0	0.528	259	
ND810	70.3	73.6	46.3	89.0	8.5	12.9	0.504	253	
Glenn	69.4	73.1	46.6	89.9	8.4	12.5	0.473	252	
MN03196	70.6	73.6	46.9	89.6	8.9	13.2	0.497	255	
ND808	72.4	76.1	47.0	89.6	7.4	13.0	0.525	253	
Crookston (K)									
ND811	69.2	72.7	46.0	90.0	9.3	13.1	0.484	248	
SD3948	70.5	73.7	47.3	90.1	8.3	13.5	0.478	256	
ND810	68.1	71.2	45.9	89.6	7.7	13.3	0.476	276	
Glenn	68.8	72.0	47.2	90.2	7.5	13.2	0.468	259	
MN03196	70.6	74.0	47.9	90.0	8.7	13.0	0.450	267	
ND808	73.2	76.8	49.0	90.3	6.7	13.2	0.452	252	
Minot (M)									
Α	73.6	78.0	46.2	89.7	8.9	12.1	0.505	254	
01S0263-28	73.1	76.8	47.8	89.5	10.4	12.8	0.454	269	
ND811	72.2	75.4	45.8	89.9	9.4	13.5	0.390	250	
SD3948	72.9	75.2	47.8	89.7	8.7	12.9	0.475	258	
В	73.4	76.6	46.5	90.0	8.5	12.9	0.490	251	
Glenn	72.9	75.9	48.5	90.0	8.1	13.4	0.433	252	
MN03196	71.8	75.0	47.3	89.8	8.5	13.0	0.441	267	
BZ903-504	71.5	75.1	45.8	89.9	8.7	13.0	0.434	266	
ND808	74.7	78.4	48.3	89.8	7.2	12.7	0.456	251	
Williston (W)	70 F	77 4	46.0	00.6	0.0	107	0 470	250	
A ND811	73.5	77.1	46.3 44.6	90.6 90.5	8.9	12.7	0.470	250	
	69.8 70.8	74.1			9.3	11.9	0.479	249	
B ND810	70.8	74.3 73.8	44.4 44.9	90.8	8.6 9.0	12.3	0.476	241	
	70.0			89.9		12.8	0.471	264 247	
Glenn	70.6	73.8	46.8	90.2	8.9 7 1	13.3	0.458	247	
ND808	73.0	76.4	45.7	90.2	7.1	12.8	0.454	231	
CA905-781	72.2	75.8	45.5	89.9	8.2	13.1	0.472	249	

Mixograph Characteristics by Location

	Mixograph								
	Envelope Peak	Envelope Peak	Envelope Peak	Midline Peak	Midline Peak	Midline Peak	Midline Peak		
	Time	Value	Width	Time	Value	Width	Integral		
Entry	Min	%	%	Min	%	%	%tg*min		
Watertown (B)									
01S0263-28	2.6	93.4	34.4	2.9	77.5	30.4	176.8		
SD3948	2.9	89.2	29.2	3.0	75.5	26.2	173.6		
CA905-780	2.1	81.3	28.6	2.5	68.7	21.1	127.0		
Glenn	3.6	87.7	33.8	4.2	72.5	29.6	232.3		
MN03196	3.1	88.3	34.3	3.2	72.1	34.0	177.3		
SD4011	2.5	82.0	25.8	2.6	69.2	25.5	136.9		
Casselton (C)	<u> </u>	70.0			00 F	07.4	400.0		
01S0263-28	3.4	76.8	29.8	3.9	62.5	27.4	188.6		
ND811	3.6	73.9	29.1	4.3	60.6	24.1	217.0		
CA905-776	2.6	88.7	33.9	3.1	75.3	25.2	171.1		
SD3948	2.9	83.5	29.6	3.3	69.5	29.3	174.1		
ND810	2.9	80.8	33.5	3.2	64.8	31.4	170.3		
Glenn	6.6	75.4 76.2	28.0	5.5	62.8	23.5	279.0		
MN03196 ND808	4.0		26.6	4.2	63.1	25.0	206.9		
Crookston (K)	2.8	80.5	28.6	3.0	66.8	27.9	156.7		
ND811	0.7	67.5	39.0	3.6	52.4	19.5	172.9		
SD3948	4.0	69.0	23.3	3.5	57.4	21.3	175.9		
ND810	2.3	73.7	28.6	2.7	60.3	24.2	141.8		
Glenn	3.6	73.5	30.4	5.4	59.6	24.9	289.2		
MN03196	3.4	79.9	33.9	4 .0	64.7	26.3	209.2		
ND808	2.9	80.5	27.5	3.3	67.5	22.7	183.4		
Minot (M)	2.0	00.0	21.0	0.0	07.0	22.1	100.1		
Α	3.1	75.1	26.7	3.1	62.2	26.8	152.1		
01S0263-28	2.4	78.7	29.2	2.7	65.8	23.6	136.0		
ND811	3.4	75.1	21.2	3.5	64.5	21.0	172.3		
SD3948	3.0	74.3	24.8	3.3	62.8	20.3	158.0		
В	2.9	85.5	32.8	3.4	70.2	25.6	176.2		
Glenn	3.4	96.1	36.6	3.9	79.7	28.7	235.8		
MN03196	2.9	87.6	29.4	3.2	74.4	20.9	176.8		
BZ903-504	3.1	86.3	30.5	3.3	71.4	29.9	176.5		
ND808	2.5	84.6	32.5	2.8	69.3	26.4	148.9		
Williston (W)									
Α	3.8	81.2	34.9	4.2	64.7	32.8	214.9		
ND811	3.5	80.8	29.4	3.8	66.7	25.2	195.0		
В	5.3	69.6	29.2	6.7	57.4	23.7	306.6		
ND810	3.3	81.7	29.6	3.4	67.2	29.7	171.3		
Glenn	4.9	87.8	34.9	5.1	70.9	34.1	255.5		
ND808	4.2	80.3	33.2	4.2	64.5	33.2	214.8		
CA905-781	5.0	80.3	30.3	4.9	65.7	30.1	239.0		

Farinograph Characteristics by Location

	Farinograph									
Entry	Water Abs 500 bu %	Water Abs 14%mb %	Arrival Time min	Peak Time min	Dough Stability min	MTI bu	TTB min			
Watertown (B)										
01S0263-28	67.6	66.6	4.2	6.8	7.0	37.0	11.3			
SD3948	66.9	66.4	3.5	6.7	7.1	35.0	10.5			
CA905-780	64.7	63.9	3.6	4.7	4.8	37.0	8.9			
Glenn	68.8	68.0	3.9	8.0	10.1	26.0	13.6			
MN03196	69.8	68.9	3.9	7.0	7.3	37.0	11.2			
SD4011	69.2	68.0	4.5	7.4	7.6	28.0	13.1			
Casselton (C)										
01S0263-28	63.9	62.2	3.0	6.5	9.0	28.0	11.1			
ND811	64.1	62.9	3.2	5.7	7.8	31.0	10.3			
CA905-776	65.8	64.2	4.7	7.3	7.7	31.0	12.3			
SD3948	64.9	63.7	2.2	5.8	6.8	39.0	9.3			
ND810	67.0	65.7	2.8	5.7	7.2	40.0	9.6			
Glenn	66.1	64.4	2.2	6.2	10.5	25.0	12.0			
MN03196	64.0	63.1	3.3	7.2	9.0	31.0	12.1			
ND808	65.9	64.7	3.2	5.7	6.7	36.0	9.8			
Crookston (K)										
ND811	65.4	64.4	1.5	2.3	3.1	51.0	4.5			
SD3948	65.1	64.5	1.9	3.7	6.2	35.0	8.2			
ND810	69.1	68.3	2.5	4.9	5.2	50.0	7.7			
Glenn	68.6	67.7	2.0	3.8	6.1	36.0	8.1			
MN03196	66.4	65.2	2.8	7.7	10.6	25.0	12.9			
ND808	65.9	65.0	2.1	3.8	6.2	37.0	7.9			
Minot (M)										
Α	65.5	63.3	3.5	6.2	5.2	48.0	8.9			
01S0263-28	65.7	64.3	5.0	7.8	8.7	21.0	14.2			
ND811	65.0	64.4	4.2	7.2	9.7	19.0	14.3			
SD3948	64.3	63.0	3.7	6.0	6.4	38.0	10.1			
В	61.3	60.0	2.8	5.8	7.6	33.0	10.5			
Glenn	66.1	65.4	4.7	9.7	11.5	25.0	15.2			
MN03196	67.6	66.4	4.7	7.5	7.4	33.0	11.9			
BZ903-504	66.0	64.8	4.0	7.2	7.7	34.0	11.4			
ND808	66.2	64.7	3.8	5.9	6.6	34.0	10.1			
Williston (W)										
A	61.7	60.2	2.8	6.2	9.3	27.0	12.0			
ND811	65.9	63.5	3.2	8.2	11.4	29.0	13.8			
В	59.8	57.9	1.8	7.2	17.1	18.0	16.6			
ND810	66.9	65.5	4.6	8.9	8.3	39.0	13.1			
Glenn	66.5	65.7	5.8	13.7	14.1	12.0	20.0			
ND808	64.9	63.5	3.5	7.4	11.0	22.0	13.0			
CA905-781	64.2	63.2	3.9	9.3	16.0	16.0	20.0			