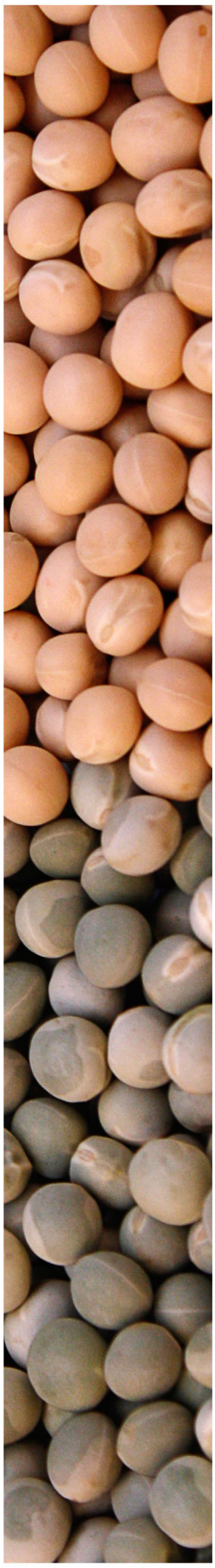

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Quality of western Canadian peas

2015

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Canada

Table of contents

Tables

Figures

Introduction

This report presents quality data for 2015 western Canadian peas from Canadian Grain Commission's Harvest Sample Program. Samples were submitted by western Canadian producers to the Canadian Grain Commission's Grain Research Laboratory for analysis.

Production

Pea production for 2015 was estimated to be 3.2 million tonnes, which was down approximately 16% from 2014. However, production was 2% higher than the 10-year average (Table 1). The decrease in production was the result of 7% reduction in harvested area and 8% reduction in yield from 2014. Saskatchewan accounted for 56% of Canadian pea production, while Alberta accounted for 42% and Manitoba accounted for 2%.

Table 1 – Production statistics for western Canadian peas[1]

	Harvested area		Production		Yield		Mean production
Province	2015	2014	2015	2014	2015	2014	2005–2014
	thousand hectares		thousand tonnes		kg/ha		thousand tonnes
Peas							
Manitoba	27	26	78	60	2900	2400	73
Saskatchewan	856	1032	1779	2256	2100	2200	2195
Alberta[2]	587	530	1344	1494	2290	2819	869
Western Canada	**1470**	**1588**	**3201**	**3810**	**2200**	**2400**	**3137**

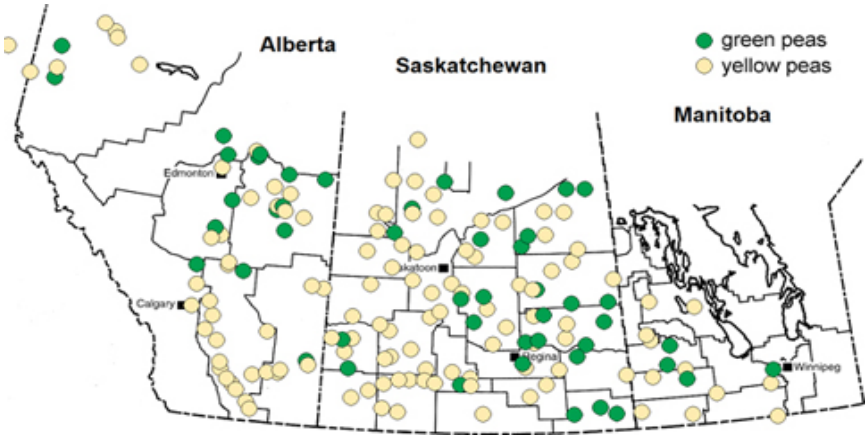
[1]Statistics Canada.
[2]Includes the Peace River area of British Columbia.

Western Canadian peas _____2015

Pea samples

Samples for the Canadian Grain Commission's Harvest Sample Program were collected from producers across western Canada (Figure 1). The Canadian Grain Commission received 496 samples consisting of 374 yellow pea samples and 122 green pea samples. All samples were graded and tested for protein content. Composite samples were prepared based on class (yellow and green), crop region and grade (No. 1 and No. 2). All composites were tested for chemical composition (moisture, protein, starch, total dietary fiber and ash content), mineral content, functional properties (water holding capacity and emulsifying capacity), and physical and cooking characteristics (100-seed weight, water absorption, cooking time and firmness of cooked peas). It is important to note that the samples reported by grade do not necessarily represent the actual distribution of grade.

Figure 1 – Map of western Canada showing origin of 2015 pea samples from Harvest Sample Program



Quality of 2015 western Canadian peas

Protein content for yellow and green peas ranged from 17.0% to 28.4% (Table 2). The mean protein content for western Canadian peas was 22.2%, which was lower than the mean of 23.4% for 2014, and lower than the ten-year mean protein content of 23.4 (Figure 2). Table 3 represents the mean protein and starch content for yellow and green peas by crop region (Figure 3).

Table 4 shows the quality data for 2015 yellow peas. Mean protein content for No. 1 Canada Yellow peas was 21.9%, which was lower than the mean for 2014 (23.3%). Mean protein content for No. 2 Canada Yellow peas was 22.2%, which was lower than the mean for 2014 (23.5%). Mean starch content for No. 1 Canada Yellow peas was 48.6%, same as the mean for No. 2 Canada Yellow peas (48.6%). The mean starch contents for both grades were similar to the means for 2014. Mean total dietary fiber content for No.1 Canada Yellow peas was 14.9%, slightly lower than the mean for No.2 Canada Yellow peas (15.5%). Mean ash contents in both grades were slightly higher than that for 2014. Potassium (K) was the most abundant macroelement present in yellow peas, followed by phosphorus (P), magnesium (Mg) and calcium (Ca) (Table 4). Among microelements, iron (Fe) was the highest, followed by zinc (Zn), manganese (Mn), and copper (Cu). Mean water holding capacity for No. 1 Canada Yellow peas was 0.90 g H_2O per g sample, which was higher than the mean value for 2014 (Table 4). Mean water hydration capacity for No. 2 Canada Yellow was 0.87 g H_2O per g sample, which was also higher than the mean value for 2014. The emulsifying capacity of No. 1 Canada Yellow peas was 267.0 mL oil per g sample, which was lower than that for 2014. The emulsifying capacity of No. 2 Canada Yellow peas was 276.3 mL oil per g sample, which was also lower than the emulsifying capacity for 2014.

Mean 100-seed weight for No. 1 Canada Yellow peas was 21.8 g (Table 4), while mean 100-seed weight for No. 2 Canada Yellow peas was 22.0 g. Mean 100-seed weights for both grades of peas were higher than those for 2014. The water absorption value for No. 1 Canada Yellow peas was 0.86 g H_2O per g seeds. For No. 2 Canada Yellow peas, the water absorption value was 0.88 g H_2O per g seeds. Water absorption values for both grades were similar to 2014 values.

Cooking times for No. 1 and No. 2 Canada Yellow peas were longer than those for 2014 (Table 4). For both No. 1 and No. 2 grades, mean firmness values of cooked peas were higher than values in 2014.

Table 5 shows the 2014 quality data for No. 1 Canada and No. 2 Canada Green peas. Mean protein content for No. 1 Canada Green peas was 21.3%, which was lower than the mean for 2014. Mean protein content for No. 2 Canada Green peas was 24.0%, which was slightly higher than the mean for 2014. Mean starch content was 48.5% for No. 1 Canada Green peas, slightly higher than the mean for 2014, and 47.6% for No. 2

Canada Green peas, similar to the mean for 2014. Mean total dietary fiber content for No. 1 Canada Green peas was 16.0%, higher than the mean for No. 2 Canada Green peas (15.5%). Ash content values for No. 1 and No. 2 Canada Green peas were similar to values in 2014. Similar trends to yellow peas for both macroelements and microelements in green peas were noted (Table 5). Mean water holding capacity for No. 1 Canada Green peas (0.85 g H_2O per g sample) was similar to the mean for No. 2 Canada Green peas (0.86 g H_2O per g sample) (Table 5). The means for both grades were slightly higher than the means for 2014. Mean emulsifying capacity was 264.8 mL oil per g sample for No. 1 Canada Green peas and 264.5 mL oil per g sample for No. 2 Canada Green peas, lower than in 2014.

Mean 100-seed weight for No. 1 Canada Green peas was 21.0 g, similar to 2014 (Table 5). Mean 100-seed weight for No. 2 Canada Green peas was 23.6 g, higher than that for 2014. Mean water absorption values for No. 1 and No. 2 Canada Green peas were similar to 2014. Mean cooking time for No. 1 Canada Green peas was 15.8 min and was 14.9 min for No. 2 Canada Green peas. Mean firmness values for cooked green peas for both grades were slightly higher than values for 2014.

Table 2 – Mean protein content for 2015 western Canadian peas (yellow and green combined) by grade[1]

Grade	Protein content, % dry basis			
	2015			2014
	Mean	Min.	Max.	Mean
Manitoba				
Peas, No. 1 Canada	22.6	19.7	25.1	NS[2]
Peas, No. 2 Canada	22.5	17.9	26.3	24.0
Peas, No. 3 Canada	22.9	19.5	24.0	24.0
All grades	**22.6**	**17.9**	**26.3**	**24.0**
Saskatchewan				
Peas, No. 1 Canada	21.9	18.0	24.8	23.1
Peas, No. 2 Canada	22.3	17.3	28.4	23.3
Peas, No. 3 Canada	22.4	18.4	26.4	24.2
All grades	**22.3**	**17.3**	**28.4**	**23.6**
Alberta				
Peas, No. 1 Canada	21.6	17.8	27.3	22.9
Peas, No. 2 Canada	22.1	18.6	26.4	23.0
Peas, No. 3 Canada	21.9	17.0	27.8	23.0
All grades	**22.0**	**17.0**	**27.8**	**23.0**
Western Canada				
Peas, No. 1 Canada	21.8	17.8	27.3	23.0
Peas, No. 2 Canada	22.3	17.3	28.4	23.2
Peas, No. 3 Canada	22.2	17.0	27.8	23.9
All grades	**22.2**	**17.0**	**28.4**	**23.4**

[1]Protein content (N x 6.25) is determined by near infrared measurement calibrated against the Combustion Nitrogen Analysis reference method.

[2]NS=insufficient number of samples to generate a representative value.

Figure 2 – Mean protein content of western Canadian peas

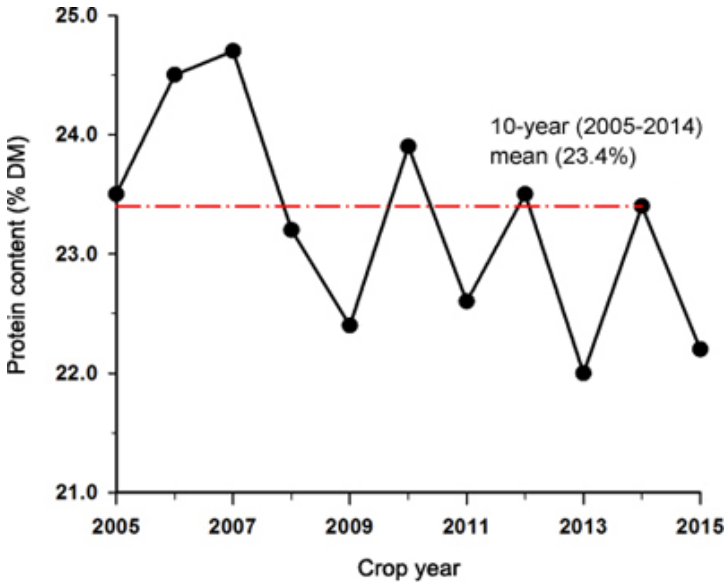


Figure 3 – Crop regions in western Canada

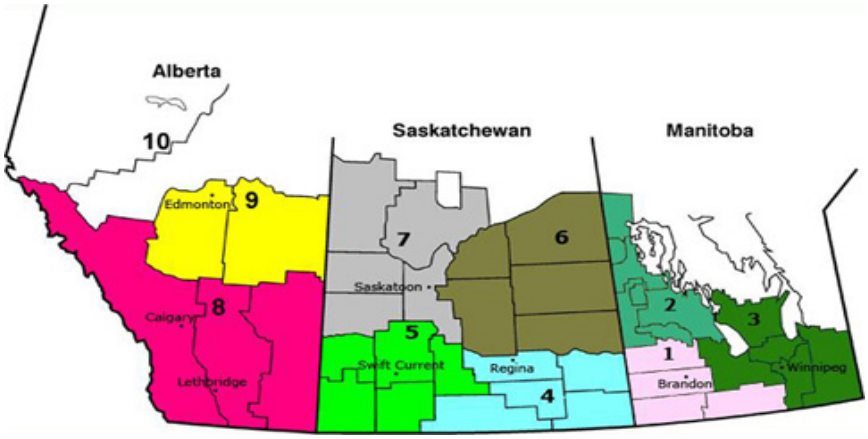


Table 3 – Mean protein and starch content for 2015 western Canadian peas (yellow and green combined) by crop region

	Protein content, % dry basis		Starch content, % dry basis	
Crop region[1]	2015	2014	2015	2014
1	22.8	NS[2]	48.1	NS
3	NS	23.3	NS	48.4
4	22.1	23.8	48.4	47.0
5	22.8	23.2	48.1	48.1
6	22.4	23.5	47.4	46.8
7	22.3	24.1	47.3	46.9
8	21.4	23.5	49.1	48.4
9	22.9	23.5	49.0	47.4
10	21.8	22.6	48.5	48.7

[1]Manitoba crop regions (Figure 3): 1 (Southwest Manitoba); 3 (Eastern Manitoba); Saskatchewan crop regions: 4 (South East Saskatchewan), 5 (South West Saskatchewan), 6 (North East Saskatchewan), and 7 (North West Saskatchewan); Alberta crop regions: 8 (Southern Alberta), 9 (Central Alberta), and 10 (Northern Alberta).
[2]NS= insufficient number of samples to generate a representative value.

Table 4 – Quality data for 2015 western Canadian yellow pea composite by grade				
	Peas, No. 1 Canada Yellow		Peas, No. 2 Canada Yellow	
Quality parameter	2015	2014	2015	2014
Chemical composition				
Moisture content, %	10.2	10.7	10.2	10.6
Protein content, % dry basis	21.9	23.3	22.2	23.5
Starch content, % dry basis	48.6	47.9	48.6	48.0
Total dietary fiber, % dry basis	14.9	NA[1]	15.5	NA
Ash content, % dry basis	2.8	2.7	3.0	2.8
Mineral (mg/100 g dry basis)				
Calcium (Ca)	90.7	80.9	96.6	78.1
Copper (Cu)	0.73	0.8	0.75	0.8
Iron (Fe)	5.2	5.4	5.5	5.6
Potassium (K)	1082.1	916.8	994.8	1035.4
Magnesium (Mg)	145.9	134.4	149.2	131.3
Manganese (Mn)	1.4	1.2	1.3	1.3
Phosphorus (P)	373.7	331.2	354.5	344.7
Zinc (Zn)	3.9	3.8	3.8	3.8
Functional property				
Water holding capacity, g H_2O/g sample	0.90	0.74	0.87	0.76
Emulsifying capacity, mL oil/g sample	267.0	275.6	276.3	283.5
Physical characteristic				
100-seed weight, g/100 seeds	21.8	20.7	22.0	20.1
Water absorption, g H_2O/g seeds	0.86	0.82	0.88	0.84
Cooking characteristic				
Cooking time, min	24.7	15.1	21.0	16.4
Firmness, N/g cooked seeds	26.2	23.7	25.6	22.7

[1]N/A=Not available (analysis was not done in 2014).

Table 5 – Quality data for 2015 western Canadian green pea composite by grade

	Peas, No. 1 Canada Green		Peas, No. 2 Canada Green	
Quality parameter	2015	2014	2015	2014
Chemical composition				
Moisture content, %	10.4	10.3	10.7	10.3
Protein content, % dry basis	21.3	23.6	24.0	23.3
Starch content, % dry basis	48.5	47.3	47.6	47.7
Total dietary fiber, % dry basis	16.0	NA[1]	15.5	NA
Ash content, % dry basis	2.7	2.8	2.9	2.9
Mineral (mg/100 g dry basis)				
Calcium (Ca)	89.1	67.9	90.6	73.3
Copper (Cu)	0.73	1.1	0.71	1.0
Iron (Fe)	5.0	8.2	5.2	9.1
Potassium (K)	996.2	920.7	937.9	895.3
Magnesium (Mg)	130.5	108.4	133.2	110.0
Manganese (Mn)	1.1	1.6	1.2	1.7
Phosphorus (P)	355.2	369.1	373.6	384.1
Zinc (Zn)	3.7	3.8	3.8	4.2
Functional property				
Water holding capacity, g H_2O/g sample	0.85	0.76	0.86	0.79
Emulsifying capacity, mL oil/g sample	264.8	279.5	264.5	280.7
Physical characteristic				
100-seed weight, g/100 seeds	21.0	21.1	23.6	19.2
Water absorption, g H_2O/g seeds	0.79	0.81	0.79	0.77
Cooking characteristic				
Cooking time, min	15.8	14.6	14.9	17.1
Firmness, N/g cooked seeds	25.4	23.3	25.1	24.9

[1]N/A=Not available (analysis was not done in 2014).