



ISSN 1920-9053

# Quality of western Canadian peas 2022

**Dr. Ning Wang**  
Program Manager, Pulse Research

Tel.: 204-983-2154  
Fax: 204-983-0724  
Email: [ning.wang@grainscanada.gc.ca](mailto:ning.wang@grainscanada.gc.ca)

Grain Research Laboratory  
Canadian Grain Commission  
1404-303 Main Street  
Winnipeg, MB R3C 3G8  
[grainscanada.gc.ca](http://grainscanada.gc.ca)



Canadian Grain  
Commission

Commission canadienne  
des grains

Canada

## Table of Contents

Introduction.....	3
Growing and harvesting conditions.....	3
Production.....	6
Harvest samples .....	7
Quality of 2022 western Canadian peas.....	8
Protein content.....	8
Canada Yellow peas.....	8
Canada Green peas.....	8
Acknowledgements.....	10

### Tables

Table 1 Production statistics for 2022 western Canadian peas .....	6
Table 2 Protein content (% dry basis) for 2022 western Canadian yellow peas by grade .....	11
Table 3 Protein content (% dry basis) for 2022 western Canadian green peas by grade .....	12
Table 4 Mean protein and mean starch content (% dry basis) for 2022 western Canadian yellow peas by crop region.....	14
Table 5 Mean protein and mean starch content (% dry basis) for 2022 western Canadian green peas by crop region .....	14
Table 6 Quality data for 2022 western Canadian yellow pea composites by grade .....	14
Table 7 Quality data for 2022 western Canadian green pea composites by grade .....	16

### Figures

Figure 1 Mean temperature difference from normal in the prairie region from June 1 to June 30, 2022.....	3
Figure 2 Mean temperature difference from normal in the prairie region from July 1 to July 31, 2022.....	4
Figure 3 Total precipitation in the prairie region from April 1 to October 31, 2022.....	4
Figure 4 Origin of 2022 pea samples received by the Canadian Grain Commission’s Harvest Sample Program .....	7
Figure 5 Mean protein content of western Canadian peas (yellow and green combined) from 2012 to 2022 ....	13
Figure 6 Crop regions in western Canada.....	13

# Introduction

This report presents data on the quality of yellow and green peas grown in western Canada in 2022. Samples were submitted to the Harvest Sample Program by pea producers and analysed by the Canadian Grain Commission’s Grain Research Laboratory.

## Growing and harvesting conditions

Figures 1 and 2 show the monthly mean temperature differences from normal in the prairie region during the 2022 growing season (June and July). Figure 3 shows the total precipitation in the prairie region from April 1 to October 31, 2022.

**Figure 1 Mean temperature difference from normal in the prairie region from June 1 to June 30, 2022**

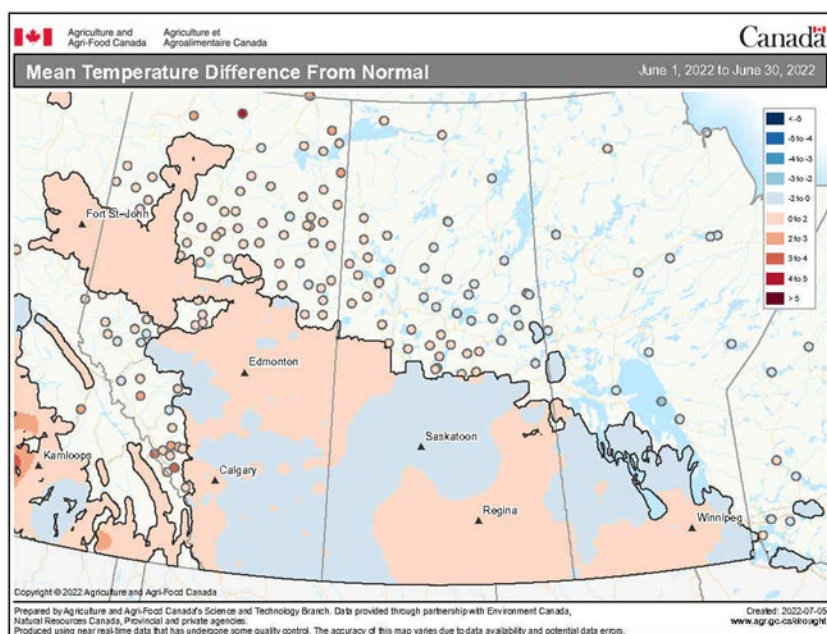


Figure 2 Mean temperature difference from normal in the prairie region from July 1 to July 31, 2022

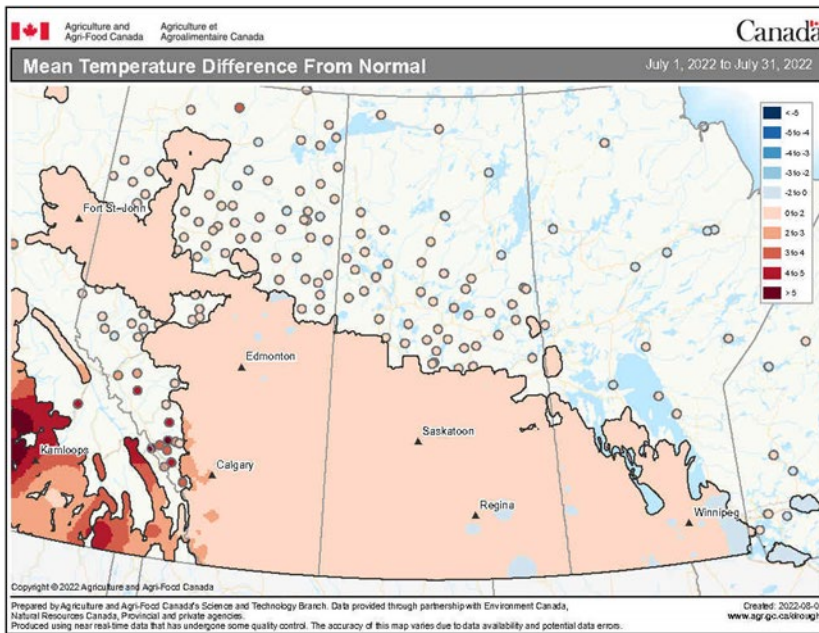
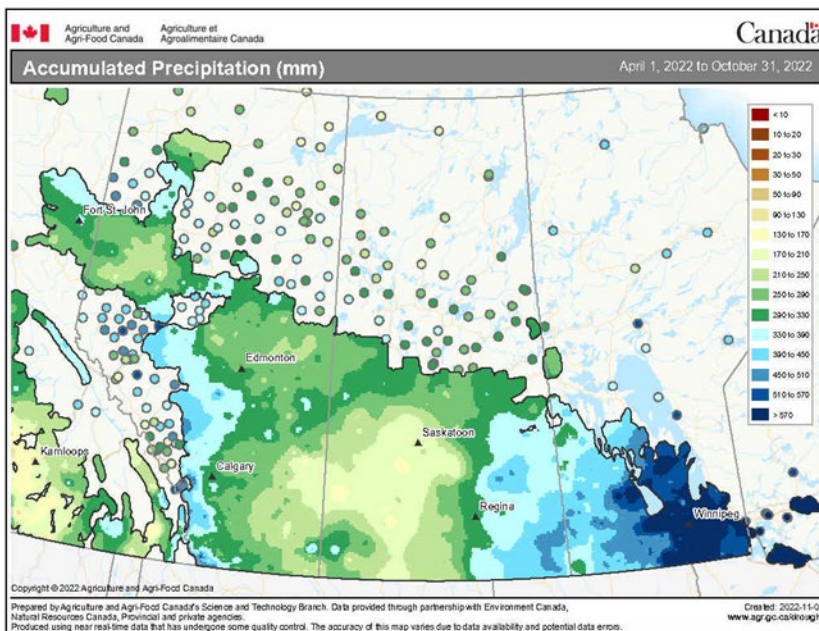


Figure 3 Total precipitation in the prairie region from April 1 to October 31, 2022



In some areas of Manitoba, a cool and wet spring resulted in flooded fields that saturated soil and delayed seeding for up to 4 weeks. Some fields near Lake Manitoba and the northern Interlake region were left unseeded due to the wet conditions. A warm summer (Figures 1 and 2) allowed pea crops to develop as expected for that time of year. In the northwest region, the harvesting of peas started in mid-August and was completed by mid-September with above average yields. For crops in other areas, the harvest period was extended to the end of October due to late seeding and late September rains (Figure 3).

In the southwest and west-central regions of Saskatchewan, seeding began in late April and continued until early May. Wet and cold conditions in the eastern part of the province (Figure 3) delayed seeding which was not completed until early June. Warm temperatures and timely rainfalls during the summer resulted in good crop growth and helped fill seed pods, except in the southwest and west-central regions. Crops in these two regions ripened prematurely due to high temperatures and a lack of moisture (Figures 2 and 3) and resulted in an early pea harvest with low yields. Harvesting of peas in the rest of the province was completed in late September. Overall yield was higher than average.

In Alberta, the growing season started with cool and dry conditions except for the Peace region that had wet conditions (Figure 3). Most of the province was dry at the end of May, especially southern Alberta, but June was wetter than normal. Temperatures were above average throughout July (Figure 2). Precipitation during June and early July improved soil moisture but by mid-July soil moisture started to deteriorate. It was warm and dry during the harvest season and harvesting was completed two to three weeks earlier than normal. The overall yield of pea crops was above the 5-year provincial average.

# Production

Pea production in 2022 was estimated to be 3.4 million tonnes, which was approximately 52% higher than in 2021 and 10.0% lower than the 10-year average of 3.8 million tonnes (Table 1). Production was higher in 2022 due to a 68.1% increase in yield from 2021. Pea production in Alberta (46.4%) and Saskatchewan (46.1%) were similar to each other but higher than pea production in Manitoba (7.5%).

**Table 1 Production statistics for 2022 western Canadian peas <sup>1</sup>**

Province	Harvested area (thousand hectares)		Production (thousand tonnes)		Yield (kg/ha) <sup>2</sup>		Mean production (thousand tonnes)
	2022	2021	2022	2021	2022	2021	2012–2021
Manitoba	76	90	256	211	3375	2346	124
Saskatchewan	727	814	1570	1106	2160	1359	2067
Alberta <sup>3</sup>	540	581	1581	925	2930	1591	1593
Western Canada	1343	1485	3407	2242	2538	1510	3784

<sup>1</sup> Source: Statistics Canada

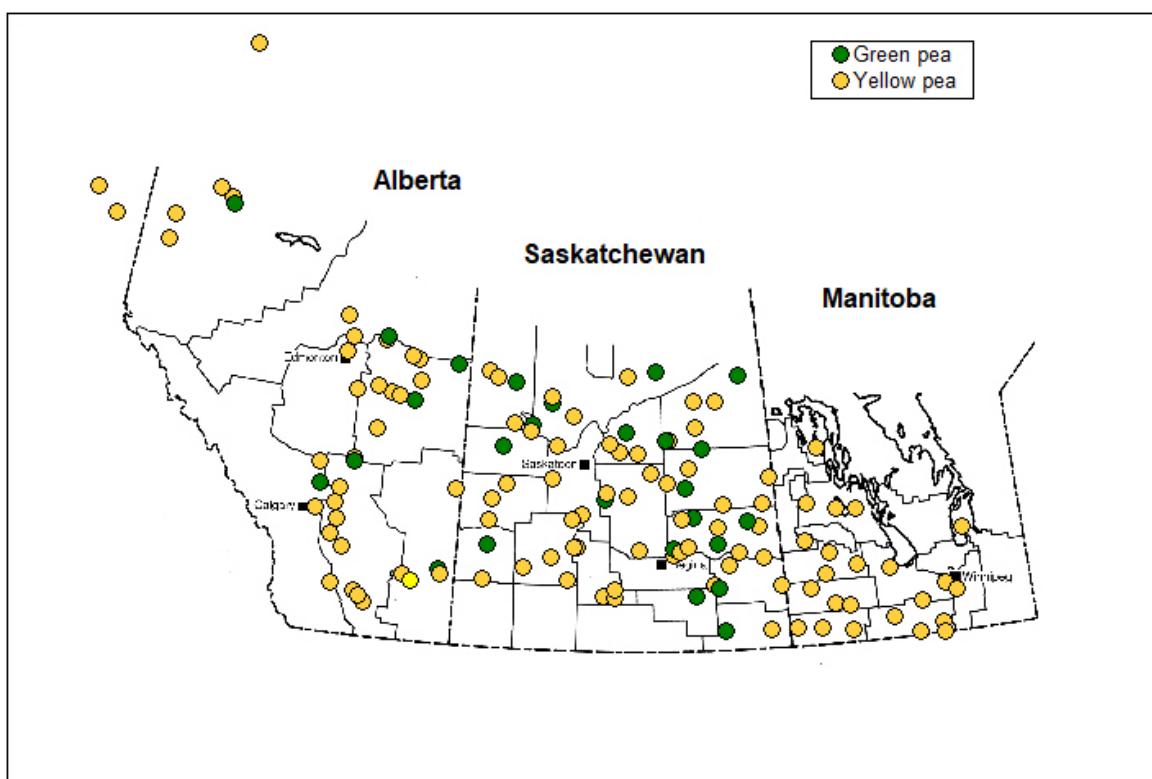
<sup>2</sup> kg/ha = kilograms per hectare

<sup>3</sup> Includes the Peace River area of British Columbia

# Harvest samples

Samples were submitted to the Canadian Grain Commission's Harvest Sample Program by pea producers across western Canada (Figure 4). The program received 461 pea samples, consisting of 369 yellow pea samples and 92 green pea samples. All samples were graded and tested for protein content. Composite samples were prepared based on class (yellow or green), crop region and grade (No. 1 or No. 2 Canada). All composites were tested for chemical composition (moisture, protein, starch, total dietary fiber, fat 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 should be noted that the samples reported by grade do not necessarily represent the actual distribution of the grade across western Canada.

Figure 4 Origin of 2022 pea samples received by the Canadian Grain Commission's Harvest Sample Program



# Quality of 2022 western Canadian peas

---

## Protein content

In Western Canada, the mean protein content ranged from 19.7 to 32.0% for yellow peas (Table 2) and ranged from 20.9 to 31.6% for green peas (Table 3). In 2022, the mean protein content was 23.9% for yellow peas and 24.7% for green peas, both of which are lower than in 2021. The mean protein content of 2022 yellow and green peas combined was 24.0%, higher than the 10-year mean (23.0%) (Figure 5). Tables 4 and 5 show the mean protein and mean starch content of yellow and green peas from each crop region (Figure 6).

## Canada Yellow peas

Table 6 contains the quality data for the yellow pea composites by grade. Mean protein and mean starch values of No. 1 (24.0%, 45.9%) and No. 2 (23.9%, 45.7%) yellow peas were lower in 2022 than in 2021. Total dietary fiber was higher in No. 1 yellow peas but was similar for No. 2 when compared to 2021. Mean ash content was similar in 2022 and 2021 for both grades of yellow peas. In 2022, the mean crude fat content was 0.97% for No. 1 yellow peas and 1.03% for No. 2 yellow peas.

In 2022, potassium (K) was the most abundant macroelement in yellow peas, followed by phosphorus (P), magnesium (Mg) and calcium (Ca) (Table 6). Among the microelements, iron (Fe) was the most abundant, followed by zinc (Zn), manganese (Mn) and copper (Cu). In 2022 and 2021, the majority of elements were present in a similar amount for both grades of yellow peas. However, the amount of Cu was lower and the amount of Mn was higher for both grades in 2022 compared to 2021. In addition, No. 2 yellow peas had a lower Fe content in 2022 than in 2021.

No. 1 and No. 2 yellow peas had the same mean water holding capacity of 0.89 grams (g) of water per g of sample, higher than in 2021 (Table 6). Mean oil emulsifying capacity of No. 1 yellow peas (277.2 millilitres (ml) of oil per g of sample) and No. 2 yellow peas (274.0 ml of oil per g of sample) was higher in 2022 than 2021.

Mean 100-seed weight of No. 1 (23.0 g) and No. 2 (23.1 g) yellow peas was higher in 2022 than in 2021. The water absorption value for No.1 (0.93 g of water per g of sample) and No. 2 (0.96 g of water per g of sample) yellow peas was lower in 2022 than in 2021.

Cooking time of No. 1 (25.3 min) and No. 2 (19.8 min) yellow peas was longer in 2022 than in 2021 (Table 6). Cooked seed texture was firmer for No. 1 yellow peas (23.7 newton per g of cooked seeds) but softer for No. 2 yellow peas (22.8 newton per g of cooked seeds) in 2022 compared to 2021.

## Canada Green peas

Table 7 contains the quality data for green pea composites by grade. The mean protein content of No. 1 (25.1%) and No. 2 (26.1%) green peas was higher in 2022 than in 2021. Mean starch content of No. 1 (44.7%) and No. 2 (44.0%) green peas was lower in 2022 than in 2021. Total dietary fiber was 17.7% for both grades of green peas in 2022, higher than in 2021. The ash content of No. 1 green peas (2.6%) in 2022 was similar to that in 2021, but was higher for No. 2 green peas (2.8%). Mean crude fat content was 0.87% for No. 1 and 0.82% for No.2 green peas. The trends for macro- and micro-elements in green peas were similar to those found in yellow peas (Table 7). Elements were present in similar amounts for both grades of green peas from 2022 and 2021 except for P, which was higher in No. 2 green peas in 2022.



In 2022, the mean water holding capacity of No. 1 green peas (0.88 g of water per g of sample) was slightly lower than in 2021 and higher for No. 2 green peas (0.89 g of water per g of sample) (Table 7). The mean oil emulsifying capacity values for No. 1 (277.7 ml of oil per g of sample) and No. 2 (284.3 ml of oil per g of sample) green peas in 2022 were higher than in 2021.

The mean 100-seed weight of No. 1 green peas (22.7 g per 100 seeds) in 2022 was higher than in 2021 and lower for No. 2 green peas (21.0 g per 100 seeds) (Table 7). Water absorption for green peas was slightly lower in 2022 for No. 1 green peas (0.94 g of water per g of seeds) and higher for No. 2 green peas (0.99 g of water per g of seeds) than in 2021. Cooking time was longer for No. 1 green peas (20.3 min) and shorter for No. 2 green peas (9.2 min) from 2022 compared to 2021. Cooked texture of No. 1 green peas (22.3 newton per g of cooked seeds) from 2022 was firmer than from 2021 and softer in No.2 green peas (20.7 newton per g of cooked seeds) (Table 7).

# Acknowledgements

---

The Grain Research Laboratory acknowledges the cooperation of western Canadian pulse processors, producers and grain handling facilities in supplying the samples of newly harvested peas. We are also grateful to the following groups within the Canadian Grain Commission: Industry Services for assistance with grading the samples, the Pulse Research Program staff for technical assistance, the staff of the trace elements unit for mineral analysis, and Multimedia services for their assistance in the publication of this document.

Table 2 Protein content (% dry basis) for 2022 western Canadian yellow peas by grade <sup>1</sup>

Province	Grade	Number of samples	2022			2021
			Mean	Minimum	Maximum	Mean
Manitoba	Peas, No. 1 Canada	9	23.0	20.8	25.9	22.9
	Peas, No. 2 Canada	26	23.0	20.2	26.9	24.4
	Peas, No. 3 Canada	5	23.3	22.3	24.1	25.5
	All grades	40	23.0	20.2	26.9	24.3
Saskatchewan	Peas, No. 1 Canada	60	23.9	20.4	32.0	25.0
	Peas, No. 2 Canada	101	24.0	19.7	29.8	25.2
	Peas, No. 3 Canada	37	24.5	21.4	30.2	24.8
	All grades	198	24.1	19.7	32.0	25.1
Alberta	Peas, No. 1 Canada	53	23.8	20.7	27.9	23.0
	Peas, No. 2 Canada	61	23.9	20.0	29.9	23.9
	Peas, No. 3 Canada	10	24.1	20.4	27.8	23.4
	All grades	124	23.9	20.0	29.9	23.8
Western Canada	Peas, No. 1 Canada	122	23.8	20.4	32.0	24.4
	Peas, No. 2 Canada	188	23.8	19.7	29.9	24.6
	Peas, No. 3 Canada	52	24.3	20.4	30.2	24.5
	All grades	362	23.9	19.7	32.0	24.5

<sup>1</sup> Protein content (Nitrogen x 6.25) is determined by near infrared measurement calibrated against the Combustion Nitrogen Analysis reference method.

Table 3 Protein content (% , dry basis) for 2022 western Canadian green peas by grade <sup>1</sup>

Province	Grade	Number of samples	2022			2021
			Mean	Minimum	Maximum	Mean
Saskatchewan	Peas, No. 1 Canada	6	26.3	23.6	31.1	24.2
	Peas, No. 2 Canada	20	25.7	22.2	31.6	25.8
	Peas, No. 3 Canada	22	23.6	20.9	26.1	24.9
	All grades	48	24.8	20.9	31.6	24.9
Alberta	Peas, No. 1 Canada	3	23.8	21.1	26.2	26.4
	Peas, No. 2 Canada	5	24.4	22.1	30.2	24.2
	Peas, No. 3 Canada	4	25.0	22.6	27.2	24.4
	All grades	12	24.5	21.1	30.2	25.0
Western Canada	Peas, No. 1 Canada	9	25.5	21.1	31.1	24.9
	Peas, No. 2 Canada	25	25.4	22.1	31.6	25.4
	Peas, No. 3 Canada	26	23.8	20.9	27.2	24.7
	All grades	60	24.7	20.9	31.6	24.9

<sup>1</sup> Protein content (Nitrogen x 6.25) is determined by near infrared measurement calibrated against the Combustion Nitrogen Analysis reference method.

Figure 5 Mean protein content of western Canadian peas (yellow and green combined) from 2012 to 2022

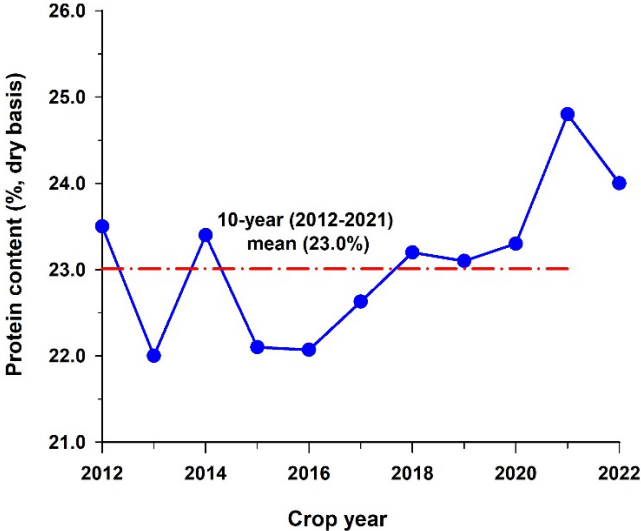


Figure 6 Crop regions in western Canada

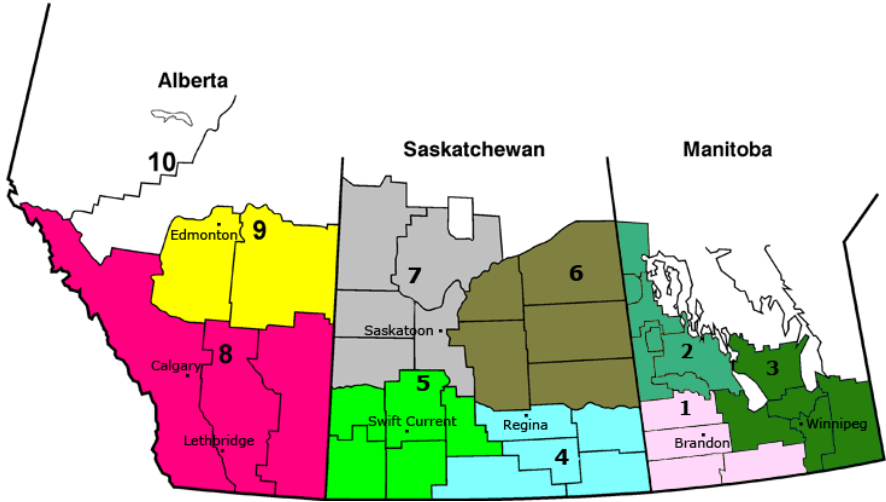


Table 4 Mean protein and mean starch content (% , dry basis) for 2022 western Canadian yellow peas by crop region

Crop region	Mean protein content		Mean starch content	
	2022	2021	2022	2021
1	23.6	24.0	45.3	47.5
2	21.3	24.0	47.1	47.8
4	23.1	24.8	46.0	47.1
5	27.3	25.9	44.7	47.1
6	22.8	25.1	46.0	46.6
7	23.7	24.4	46.5	47.2
8	25.0	24.7	44.7	46.8
9	22.9	23.3	46.7	46.2
10	23.0	23.0	47.3	46.4

Table 5 Mean protein and mean starch content (% , dry basis) for 2022 western Canadian green peas by crop region

Crop region	Mean protein content		Mean starch content	
	2022	2021	2022	2021
4	24.2	24.6	44.9	46.9
5	27.8	27.1	44.0	45.3
7	26.3	25.5	42.3	45.8
8	28.6	26.3	42.4	44.6

Table 6 Quality data for 2022 western Canadian yellow pea composites by grade

Category	Quality parameter	Peas, No. 1 Canada Yellow		Peas, No. 2 Canada Yellow	
		2022	2021	2022	2021
Chemical composition	Moisture content, %	10.5	11.1	10.4	11.0
	Protein content, % (dry basis)	24.0	24.6	23.9	24.6
	Starch content, % (dry basis)	45.9	47.1	45.7	46.8
	Total dietary fiber, % (dry basis)	17.5	15.5	16.5	16.5
	Fat content, % (dry basis)	0.97	NA <sup>1</sup>	1.03	NA
	Ash content, % (dry basis)	2.6	2.6	2.7	2.6
Mineral (mg/100 g sample <sup>2</sup> , dry basis)	Calcium (Ca)	95.4	94.5	91.8	99.6
	Copper (Cu)	0.69	0.80	0.68	0.81
	Iron (Fe)	5.3	5.6	5.6	7.0
	Potassium (K)	1052.5	1050.7	1082.2	1050.6
	Magnesium (Mg)	143.7	141.5	146.2	144.2
	Manganese (Mn)	1.4	1.2	1.4	1.2
	Phosphorus (P)	360.7	345.7	368.3	356.1
Functional property	Zinc (Zn)	3.4	3.7	3.5	3.8
	Water holding capacity, g H <sub>2</sub> O/g sample <sup>3</sup>	0.89	0.87	0.89	0.88
	Emulsifying capacity, mL oil/g sample <sup>4</sup>	277.2	268.5	274.0	268.4
Physical characteristic	100-seed weight, g/100 seeds <sup>5</sup>	23.0	21.5	23.1	21.6
	Water absorption, g H <sub>2</sub> O/g seeds	0.93	0.97	0.96	0.97
Cooking characteristic	Cooking time, min	25.3	24.3	19.8	15.9
	Firmness, N/g <sup>6</sup> cooked seeds	23.7	22.5	22.8	23.7

<sup>1</sup> NA = not available

<sup>2</sup> mg/100 g sample = milligrams per 100 grams of sample

<sup>3</sup> g H<sub>2</sub>O/g sample or seeds = grams of water per gram of sample or seeds

<sup>4</sup> mL oil/g sample = millilitres of oil per gram of sample

<sup>5</sup> g/100 seeds = grams per 100 seeds

<sup>6</sup> N/g = newton per gram (the firmness of cooked peas, which is the maximum force required to shear the cooked seeds)

Table 7 Quality data for 2022 western Canadian green pea composites by grade

Category	Quality parameter	Peas, No. 1 Canada Green		Peas, No. 2 Canada Green	
		2022	2021	2022	2021
Chemical composition	Moisture content, %	10.2	11.3	10.5	11.1
	Protein content, % (dry basis)	25.1	24.9	26.1	25.1
	Starch content, % (dry basis)	44.7	46.3	44.0	46.2
	Total dietary fiber, % (dry basis)	17.7	16.2	17.7	15.2
	Fat content, % (dry basis)	0.87	NA <sup>1</sup>	0.82	NA
	Ash content, % (dry basis)	2.6	2.7	2.8	2.5
Mineral (mg/100 g sample <sup>2</sup> , dry basis)	Calcium (Ca)	86.7	82.1	84.9	92.6
	Copper (Cu)	0.67	0.74	0.77	0.74
	Iron (Fe)	5.0	5.1	5.4	5.3
	Potassium (K)	1065.5	1106.7	1082.7	1026.6
	Magnesium (Mg)	137.6	139.7	141.3	132.5
	Manganese (Mn)	1.2	1.1	1.2	1.2
	Phosphorus (P)	369.4	369.3	430.3	355.6
	Zinc (Zn)	3.4	3.4	3.5	3.7
Functional property	Water holding capacity, g H <sub>2</sub> O/g sample <sup>3</sup>	0.88	0.89	0.89	0.87
	Emulsifying capacity, mL oil/g sample <sup>4</sup>	277.7	274.6	284.3	258.0
Physical characteristic	100-seed weight, g/100 seeds <sup>5</sup>	22.7	21.7	21.0	22.9
	Water absorption, g H <sub>2</sub> O/g seeds <sup>3</sup>	0.94	0.95	0.99	0.94
Cooking characteristic	Cooking time, min	20.3	15.9	9.2	20.6
	Firmness, N/g <sup>6</sup> cooked seeds	22.3	21.6	20.7	26.2

<sup>1</sup> NA = not available

<sup>2</sup> mg/100 g sample = milligrams per 100 grams of sample

<sup>3</sup> g H<sub>2</sub>O/g sample or seeds = grams of water per gram of sample or seeds

<sup>4</sup> mL oil/g sample = millilitres of oil per gram of sample

<sup>5</sup> g/100 seeds = grams per 100 seeds

<sup>6</sup> N/g = newton per gram (the firmness of cooked peas, which is the maximum force required to shear the cooked seeds)