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# Quality of western Canadian peas 2024

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# Introduction

This report presents harvest quality data for yellow and green peas grown in western Canada in 2024. Pea samples were submitted to the Canadian Grain Commission's Harvest Sample Program by producers and grain companies. Quality data is compiled from the results of [analytical tests](#) performed in the Grain Research Laboratory.

## Growing and harvesting conditions

Figure 1 and Figure 2 show the monthly mean temperature differences from normal in the Prairie region during the 2024 growing season (June and July). Figure 3 shows the total precipitation in the Prairie region from April 1 to October 31, 2024.

**Figure 1 Mean temperature difference from normal in the Prairie region from June 1 to June 30, 2024**

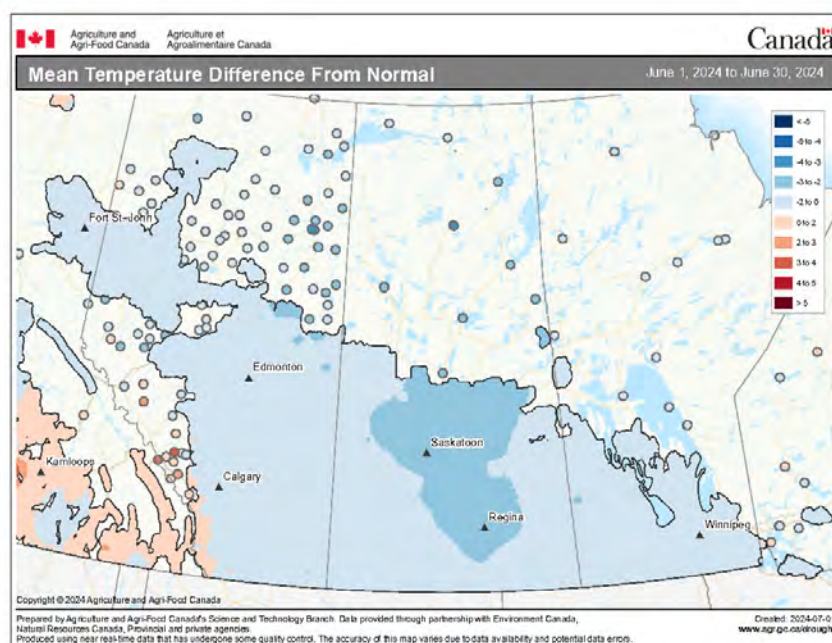


Figure 2 Mean temperature difference from normal in the Prairie region from July 1 to July 31, 2024

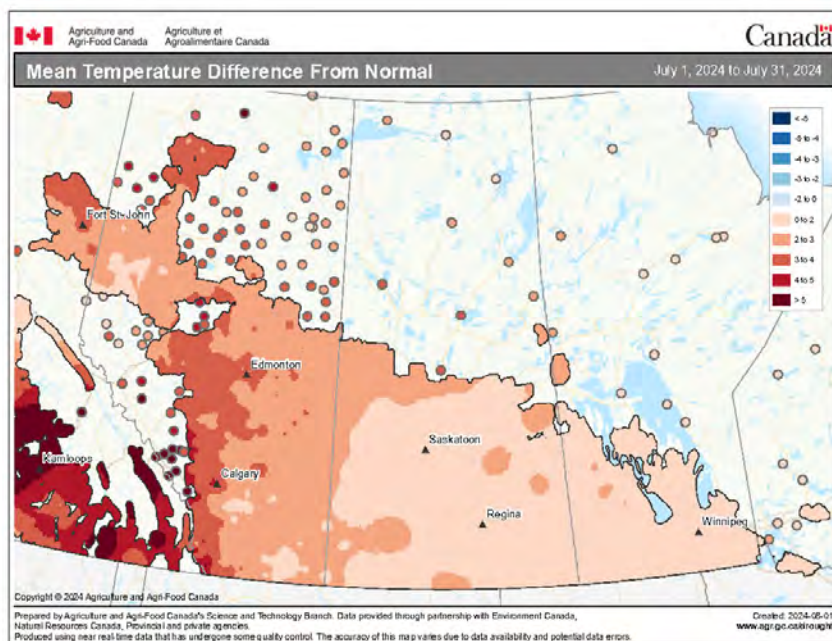
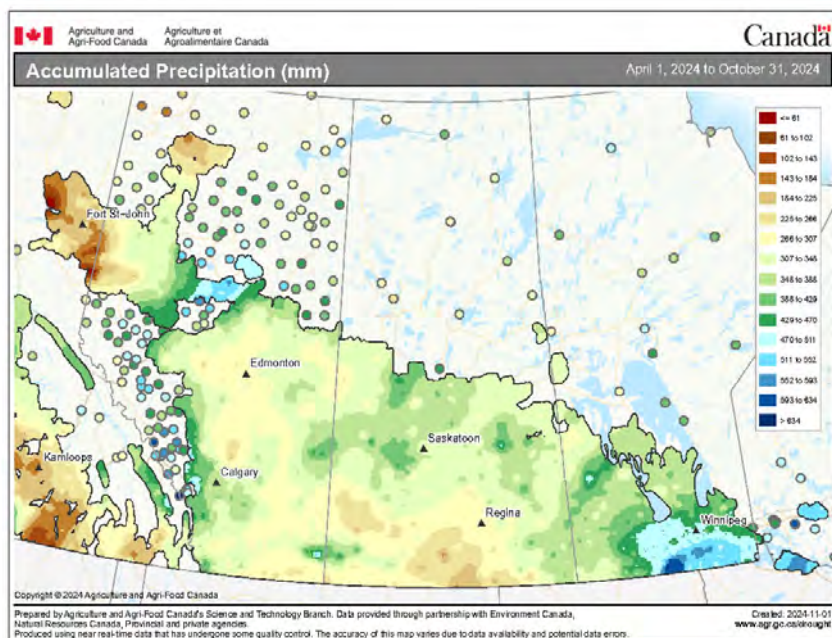


Figure 3 Total precipitation in the Prairie region from April 1 to October 31, 2024



In Manitoba, pea seeding started in late April. Cold and wet conditions in the spring (Figure 1 and Figure 3) slowed seeding progress and plant growth. By mid-June, pea planting was 98% complete. Warm temperatures in mid-July and August (Figure 2) allowed crops to recover and grow rapidly. The pea harvest began in mid-August and was complete by late September. Yields varied greatly depending on the moisture conditions. In some areas of the central and eastern regions, yields were low due to excess moisture. Overall, the quality of the pea crop was good.

In Saskatchewan, seeding started in early May and was complete by early June. Cooler temperatures and rainfalls during this period (Figure 1 and Figure 3) delayed seeding operations and slowed plant growth. In July and August, crops developed and matured rapidly due to persistently hot and dry conditions (Figure 2 and Figure 3). The pea harvest began in early August and was complete by early September. Yields were below average in the southeast and southwest regions, but in the rest of the province they were average or above average. The quality of peas was good, and most were in the top two grades.

In Alberta, warm weather allowed seeding to begin in mid-April. Cooler temperatures and rainfalls (Figure 1 and Figure 3) interrupted seeding and slowed plant growth. Seeding was complete by early June, well ahead of the historical average date in the Peace region. Heat and drought stress in July (Figure 2) caused crops to come out of flowering prematurely. Some storms during August brought moisture that relieved stress in pea plants and helped fill pods. Harvest was completed at a record pace between mid-August and mid-September due to favourable weather. Compared to the 5-year average, more peas were in the top two grades, and yields were higher than expected in the south, northwest and Peace regions.

# Production

Pea production in 2024 was estimated to be 3.0 million tonnes, which is 14.9% higher than in 2023, and 18.3% lower than the 10-year average of 3.7 million tonnes (Table 1). The higher production is due to a 7.7% increase in yield and a 6.7% increase in harvested area compared to 2023. Saskatchewan had the highest proportion of pea production (51.3%), followed by Alberta (39.9%) and Manitoba (8.8%).

Table 1 Production statistics for 2024 western Canadian peas <sup>1</sup>

| Location             | Harvested area (thousand hectares) |      | Production (thousand tonnes) |      | Yield (kg/ha) <sup>2</sup> |      | Mean production (thousand tonnes) |
|----------------------|------------------------------------|------|------------------------------|------|----------------------------|------|-----------------------------------|
|                      | 2024                               | 2023 | 2024                         | 2023 | 2024                       | 2023 | 2014–2023                         |
| Manitoba             | 76                                 | 65   | 262                          | 218  | 3434                       | 3354 | 157                               |
| Saskatchewan         | 698                                | 633  | 1533                         | 1269 | 2195                       | 2004 | 1887                              |
| Alberta <sup>3</sup> | 501                                | 497  | 1191                         | 1111 | 2377                       | 2236 | 1609                              |
| Western Canada       | 1276                               | 1195 | 2985                         | 2599 | 2341                       | 2174 | 3654                              |

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

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

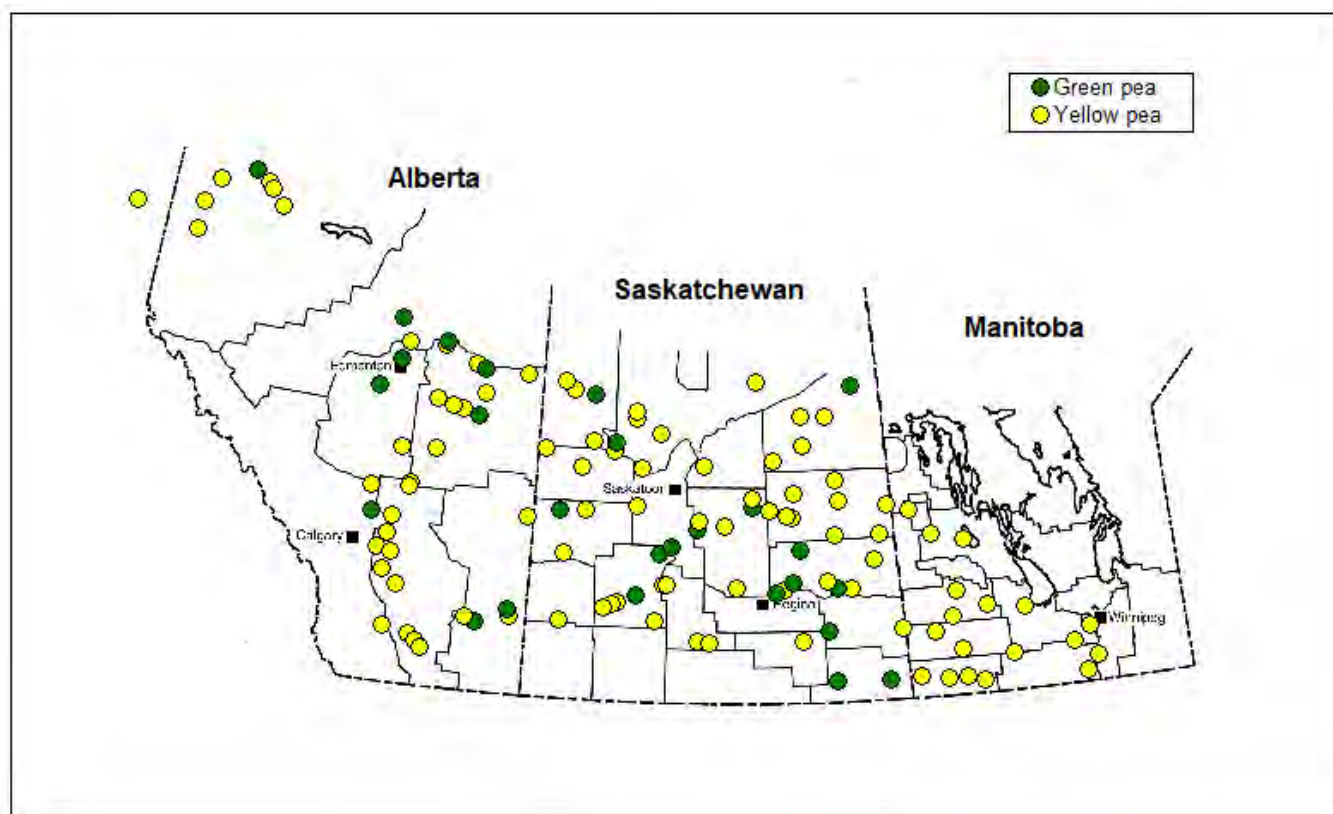
<sup>3</sup> Includes the Peace River area of British Columbia.

# Harvest samples

Samples were submitted to the Canadian Grain Commission's Harvest Sample Program by pea producers and grain companies across western Canada (Figure 4). The program received 341 pea samples, consisting of 277 yellow pea samples and 64 green pea samples.

All samples were graded and analyzed 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, crude fat, 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). Samples reported by grade do not necessarily represent the actual distribution of grades across western Canada.

**Figure 4** Origin of 2024 pea samples received by the Canadian Grain Commission's Harvest Sample Program



# Quality of 2024 western Canadian peas

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## Protein content

The protein content for yellow peas (Table 2) ranged from 19.4% to 32.2%, with a mean of 25.2%, and ranged from 22.1% to 30.6%, with a mean of 25.8%, for green peas (Table 3). The mean protein content for each type of pea was higher than in 2023. The mean protein content for yellow and green peas combined was higher in 2024 than the 10-year mean of 23.2% (Figure 5). Table 4 and Table 5 contain the mean protein and starch values for yellow and green peas according to the applicable crop regions in Figure 6.

## Yellow peas

Table 6 contains the 2024 quality data for yellow pea composites by grade. For No. 1 and No. 2 yellow peas, the protein content was higher (24.6% and 25.2%) than in 2023, but the starch content (46.0% and 45.5%) was lower than in 2023. Both grades were higher in total dietary fiber and ash but lower in crude fat compared to 2023.

Potassium (K) was the most abundant macroelement present in yellow peas, followed by phosphorus (P), magnesium (Mg) and calcium (Ca). Among the microelements, iron (Fe) was the most abundant, followed by zinc (Zn), manganese (Mn) and copper (Cu). The majority of elements in No. 1 and No. 2 yellow peas were present at higher levels than in 2023.

Compared to 2023, No. 1 and No. 2 yellow peas did not differ in their values for water holding capacity but had higher values for oil emulsifying capacity (299.4 and 297.2 millilitres of oil per gram of sample).

The values for 100-seed weight for No. 1 and No. 2 yellow peas (20.1 and 19.7 grams per 100 seeds) were lower but the values for water absorption per gram of seeds were higher than in 2023.

Both No. 1 and No. 2 yellow peas had lower cooking times (18.3 and 17.5 minutes) and reduced firmness (21.6 and 21.2 newtons per gram of cooked seeds) compared to 2023.

## Green peas

Table 7 contains the 2024 quality data for green pea composites by grade. The protein content for No. 1 green peas (25.7%) and No. 2 green peas (26.1%) was higher than in 2023. The starch content for No. 1 green peas (45.1%) and No. 2 green peas (45.3%) was slightly lower than in 2023. Both grades of green peas showed lower total dietary fiber (15.6% and 15.0%) and crude fat (0.91% and 0.85%) than in 2023. The ash content for both grades of green peas was higher than in 2023. The trends in macroelement and microelement content in 2024 green peas were similar to those described above for yellow peas, with higher levels for the majority of elements in No. 1 and No. 2 green peas compared to 2023.

No. 1 and No. 2 green peas had lower values for water holding capacity (0.90 and 0.91 grams of water per gram of sample) but higher values for oil emulsifying capacity (300.8 and 300.3 millilitres of oil per gram of sample) than in 2023.

The values for 100-seed weight for No. 1 and No. 2 green peas (19.8 and 20.1 grams) were lower than in 2023. Water absorption was lower for No. 1 green peas but higher for No. 2 green peas (0.90 and 0.94 grams of water

per gram seeds) compared to 2023. Both No. 1 and No. 2 green peas had lower cooking times (15.3 min and 15.7 min) and reduced firmness (22.0 and 20.7 newtons per gram of cooked seeds) compared to 2023.

# Acknowledgements

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The Grain Research Laboratory acknowledges the cooperation of western Canadian pulse processors, producers and grain companies 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 2024 western Canadian yellow peas by grade <sup>1</sup>

| Location       | Grade              | Number of samples | 2024 |         |         | 2023 |
|----------------|--------------------|-------------------|------|---------|---------|------|
|                |                    |                   | Mean | Minimum | Maximum | Mean |
| Manitoba       | Peas, No. 1 Canada | 18                | 23.9 | 22.0    | 25.4    | 22.7 |
|                | Peas, No. 2 Canada | 9                 | 22.2 | 19.4    | 24.8    | 23.1 |
|                | Peas, No. 3 Canada | 5                 | 24.4 | 23.3    | 25.7    | 23.3 |
|                | All grades         | 32                | 23.5 | 19.4    | 25.7    | 22.9 |
| Saskatchewan   | Peas, No. 1 Canada | 36                | 25.2 | 20.2    | 30.7    | 22.9 |
|                | Peas, No. 2 Canada | 76                | 25.5 | 22.0    | 32.2    | 23.5 |
|                | Peas, No. 3 Canada | 33                | 26.6 | 21.3    | 30.7    | 23.9 |
|                | All grades         | 145               | 25.7 | 20.2    | 32.2    | 23.4 |
| Alberta        | Peas, No. 1 Canada | 29                | 24.8 | 21.2    | 28.8    | 23.4 |
|                | Peas, No. 2 Canada | 56                | 25.1 | 21.3    | 31.1    | 23.4 |
|                | Peas, No. 3 Canada | 13                | 25.0 | 21.8    | 30.3    | 24.8 |
|                | All grades         | 98                | 25.0 | 21.2    | 31.1    | 23.6 |
| Western Canada | Peas, No. 1 Canada | 72                | 24.9 | 20.2    | 30.7    | 23.0 |
|                | Peas, No. 2 Canada | 152               | 25.1 | 19.4    | 32.2    | 23.4 |
|                | Peas, No. 3 Canada | 48                | 26.0 | 21.3    | 30.7    | 24.0 |
|                | All grades         | 272               | 25.2 | 19.4    | 32.2    | 23.4 |

<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 2024 western Canadian green peas by grade <sup>1</sup>

| Location       | Grade              | Number of samples | 2024 |         |         | 2023    |
|----------------|--------------------|-------------------|------|---------|---------|---------|
|                |                    |                   | Mean | Minimum | Maximum | Mean    |
| Saskatchewan   | Peas, No. 1 Canada | 12                | 25.6 | 22.9    | 27.8    | 25.3    |
|                | Peas, No. 2 Canada | 12                | 25.7 | 22.1    | 30.6    | 23.4    |
|                | Peas, No. 3 Canada | 6                 | 26.5 | 24.5    | 28.1    | 24.6    |
|                | All grades         | 30                | 25.8 | 22.1    | 30.6    | 24.6    |
| Alberta        | Peas, No. 1 Canada | 3                 | 26.8 | 26.4    | 27.5    | no data |
|                | Peas, No. 2 Canada | 2                 | 26.7 | 26.3    | 27.0    | 24.5    |
|                | Peas, No. 3 Canada | 7                 | 25.3 | 23.5    | 26.5    | 22.1    |
|                | All grades         | 12                | 25.8 | 23.5    | 27.5    | 23.8    |
| Western Canada | Peas, No. 1 Canada | 15                | 25.8 | 22.9    | 27.8    | 25.3    |
|                | Peas, No. 2 Canada | 14                | 25.8 | 22.1    | 30.6    | 23.9    |
|                | Peas, No. 3 Canada | 13                | 25.8 | 23.5    | 28.1    | 23.7    |
|                | All grades         | 42                | 25.8 | 22.1    | 30.6    | 24.2    |

<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 (% dry basis) of western Canadian peas from 2014 to 2024

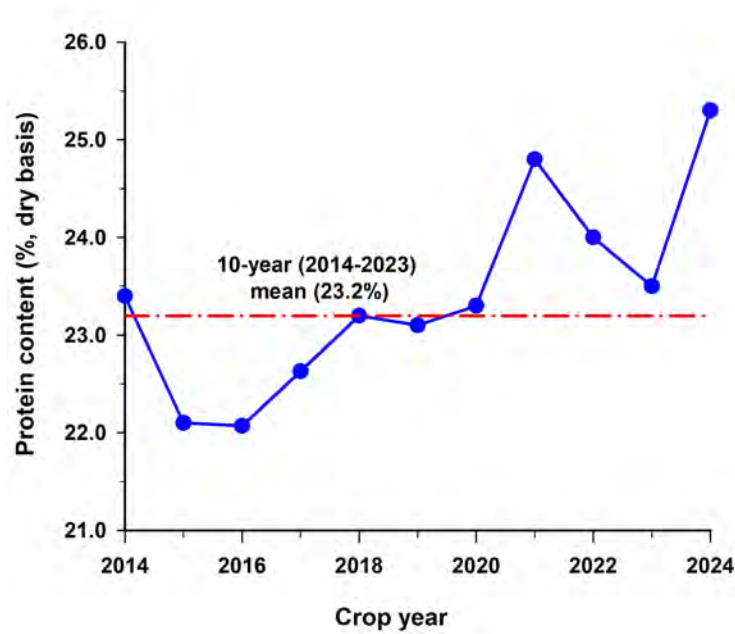


Figure 6 Crop regions in western Canada

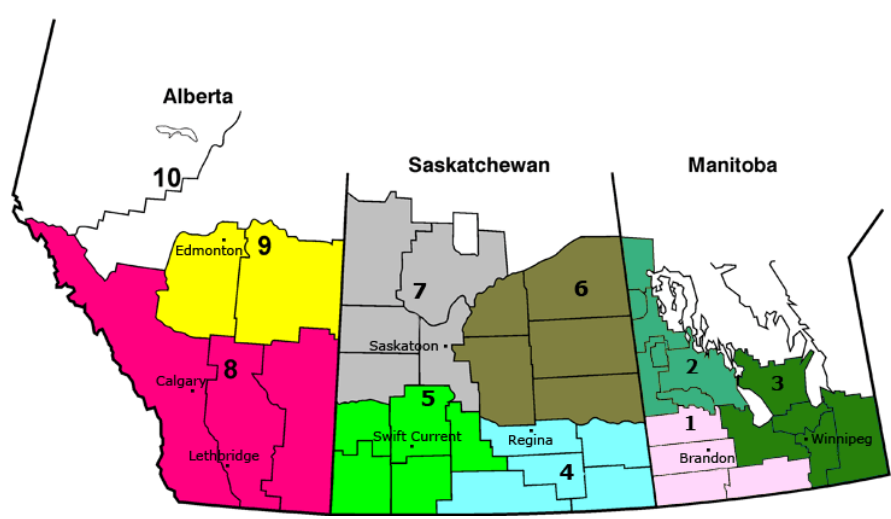


Table 4 Mean protein and mean starch content (% , dry basis) for 2024 western Canadian yellow peas by crop region

| Crop region | Mean protein content |         | Mean starch content |         |
|-------------|----------------------|---------|---------------------|---------|
|             | 2024                 | 2023    | 2024                | 2023    |
| 1           | 23.4                 | 22.8    | 46.1                | 47.9    |
| 3           | 23.8                 | no data | 45.9                | no data |
| 4           | 26.0                 | 22.7    | 44.5                | 48.6    |
| 5           | 27.0                 | 24.8    | 45.0                | 47.0    |
| 6           | 23.9                 | 22.6    | 46.2                | 48.2    |
| 7           | 24.5                 | 23.2    | 45.1                | 48.5    |
| 8           | 26.4                 | 24.3    | 45.9                | 47.7    |
| 9           | 23.6                 | 22.6    | 46.3                | 48.3    |
| 10          | 23.3                 | 21.4    | 46.9                | 48.3    |

Table 5 Mean protein and mean starch content (% , dry basis) for 2024 western Canadian green peas by crop region

| Crop region | Mean protein content |         | Mean starch content |         |
|-------------|----------------------|---------|---------------------|---------|
|             | 2024                 | 2023    | 2024                | 2023    |
| 4           | 26.7                 | 23.4    | 44.2                | 46.6    |
| 6           | 24.3                 | no data | 46.4                | no data |
| 7           | 24.9                 | 25.6    | 46.0                | 45.7    |

Table 6 Quality data for 2024 western Canadian yellow pea composites by grade

| Category                     | Quality parameter                                                | Peas, No. 1 Canada |        | Peas, No. 2 Canada |        |
|------------------------------|------------------------------------------------------------------|--------------------|--------|--------------------|--------|
|                              |                                                                  | 2024               | 2023   | 2024               | 2023   |
| Chemical composition         | Moisture, %                                                      | 10.5               | 11.0   | 10.7               | 10.9   |
|                              | Protein, %, dry basis                                            | 24.6               | 22.8   | 25.2               | 23.4   |
|                              | Starch, %, dry basis                                             | 46.0               | 48.5   | 45.5               | 47.9   |
|                              | Total dietary fiber, %, dry basis                                | 16.0               | 15.8   | 16.8               | 16.3   |
|                              | Crude fat, %, dry basis                                          | 1.04               | 1.35   | 1.04               | 1.30   |
|                              | Ash, %, dry basis                                                | 2.6                | 2.5    | 2.7                | 2.5    |
| Mineral content <sup>1</sup> | Calcium, mg/100 g sample <sup>2</sup>                            | 90.9               | 87.4   | 89.6               | 86.1   |
|                              | Copper, mg/100 g sample                                          | 0.71               | 0.70   | 0.71               | 0.68   |
|                              | Iron, mg/100 g sample                                            | 5.3                | 5.0    | 5.7                | 5.3    |
|                              | Potassium, mg/100 g sample                                       | 1057.1             | 1038.8 | 1071.6             | 1031.2 |
|                              | Magnesium, mg/100 g sample                                       | 143.4              | 135.9  | 143.1              | 135.1  |
|                              | Manganese, mg/100 g sample                                       | 1.3                | 1.3    | 1.3                | 1.1    |
|                              | Phosphorus, mg/100 g sample                                      | 373.9              | 308.3  | 387.7              | 311.4  |
|                              | Zinc, mg/100 g sample                                            | 3.7                | 3.5    | 3.9                | 3.4    |
| Functional properties        | Water holding capacity, g H <sub>2</sub> O/g sample <sup>3</sup> | 0.91               | 0.91   | 0.92               | 0.92   |
|                              | Emulsifying capacity, ml oil/g sample <sup>4</sup>               | 299.4              | 272.8  | 297.2              | 270.6  |
| Physical characteristics     | 100-seed weight, g/100 seeds <sup>5</sup>                        | 20.1               | 22.5   | 19.7               | 22.1   |
|                              | Water absorption, g H <sub>2</sub> O/g seeds <sup>6</sup>        | 0.97               | 0.95   | 0.98               | 0.95   |
| Cooking characteristics      | Cooking time, min                                                | 18.3               | 25.4   | 17.5               | 29.8   |
|                              | Firmness, N/g cooked seeds <sup>7</sup>                          | 21.6               | 26.6   | 21.2               | 26.4   |

<sup>1</sup> On a dry matter basis.

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

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

<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> g H<sub>2</sub>O/g seeds = grams of water per gram of seeds.

<sup>7</sup> N/g cooked seeds = newtons per gram of cooked seeds (the maximum force required to shear cooked seeds).

**Table 7 Quality data for 2024 western Canadian green pea composites by grade**

| Category                     | Quality parameter                                                | Peas, No. 1 Canada |        | Peas, No. 2 Canada |        |
|------------------------------|------------------------------------------------------------------|--------------------|--------|--------------------|--------|
|                              |                                                                  | 2024               | 2023   | 2024               | 2023   |
| Chemical composition         | Moisture, %                                                      | 10.7               | 11.9   | 10.5               | 11.3   |
|                              | Protein, %, dry basis                                            | 25.7               | 25.4   | 26.1               | 23.5   |
|                              | Starch, %, dry basis                                             | 45.1               | 45.5   | 45.3               | 45.9   |
|                              | Total dietary fiber, %, dry basis                                | 15.6               | 16.5   | 15.0               | 17.2   |
|                              | Crude fat, %, dry basis                                          | 0.91               | 1.08   | 0.85               | 1.15   |
|                              | Ash, %, dry basis                                                | 2.7                | 2.5    | 2.7                | 2.5    |
| Mineral content <sup>1</sup> | Calcium, mg/100 g sample <sup>2</sup>                            | 81.4               | 78.6   | 79.3               | 77.9   |
|                              | Copper, mg/100 g sample                                          | 0.69               | 0.72   | 0.69               | 0.64   |
|                              | Iron, mg/100 g sample                                            | 5.0                | 5.1    | 5.4                | 4.7    |
|                              | Potassium, mg/100 g sample                                       | 1053.2             | 1001.8 | 1074.7             | 1046.5 |
|                              | Magnesium, mg/100 g sample                                       | 138.4              | 130.9  | 140.3              | 131.1  |
|                              | Manganese, mg/100 g sample                                       | 1.2                | 1.0    | 1.3                | 1.1    |
|                              | Phosphorus, mg/100 g sample                                      | 363.6              | 337.3  | 387.2              | 317.1  |
|                              | Zinc, mg/100 g sample                                            | 3.3                | 3.3    | 3.4                | 3.4    |
| Functional properties        | Water holding capacity, g H <sub>2</sub> O/g sample <sup>3</sup> | 0.90               | 0.91   | 0.91               | 0.93   |
|                              | Emulsifying capacity, ml oil/g sample <sup>4</sup>               | 300.8              | 286.5  | 300.3              | 276.9  |
| Physical characteristics     | 100-seed weight, g/100 seeds <sup>5</sup>                        | 19.8               | 21.1   | 20.1               | 22.6   |
|                              | Water absorption, g H <sub>2</sub> O/g seeds <sup>6</sup>        | 0.90               | 0.93   | 0.94               | 0.87   |
| Cooking characteristics      | Cooking time, min                                                | 15.3               | 17.2   | 15.7               | 23.8   |
|                              | Firmness, N/g cooked seeds <sup>7</sup>                          | 22.0               | 22.4   | 20.7               | 25.1   |

<sup>1</sup> On a dry matter basis.

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

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

<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> g H<sub>2</sub>O/g seeds = grams of water per gram of seeds.

<sup>7</sup> N/g cooked seeds = newtons per gram of cooked seeds (the maximum force required to shear cooked seeds).