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Quality of western Canadian flaxseed 2025

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Introduction

This report presents harvest quality data for western Canadian flaxseed grown in 2025. Flaxseed samples were submitted to the Canadian Grain Commission's Harvest Sample Program by producers and grain companies. Quality data are compiled from the results of analytical tests performed by the Grain Research Laboratory.

Summary

Samples of Canadian flaxseed received by the Harvest Sample Program in 2025 had an overall oil content that was higher than in 2024 and an overall protein content that was lower than in 2024. The overall iodine value for brown flaxseed was lower and the overall iodine value for yellow flaxseed was higher, compared to 2024.

Table 1 and Table 2 contain the 2025 quality data for brown flaxseed graded No. 1 Canada Western (CW). The mean oil content was 45.1%, which was higher than the 2024 mean (44.5%) and the 5-year mean (44.8%). The mean protein content was 23.1%, which was lower than the 2024 mean (24.7%) and the 5-year mean (24.6%). All oil and protein values are reported on a dry matter basis. The mean iodine value was 191.3 units, which was lower than the 2024 mean (192.0 units) but higher than the 5-year mean (188.7 units).

Table 3 and Table 4 contain the 2025 quality data for yellow flaxseed graded No. 1 CW. The mean oil content was 46.1%, which was higher than the 2024 mean (44.9%) and the 5-year mean (45.7%). The mean protein content was 24.3%, which was lower than the 2024 mean (25.6%) and the 5-year mean (25.0%). The mean iodine value was 195.4 units, which was higher than the 2024 mean (194.3 units) but below the 5-year mean (198.5 units).

Figure 1 Traditional flaxseed growing regions in the Prairie provinces of Canada.

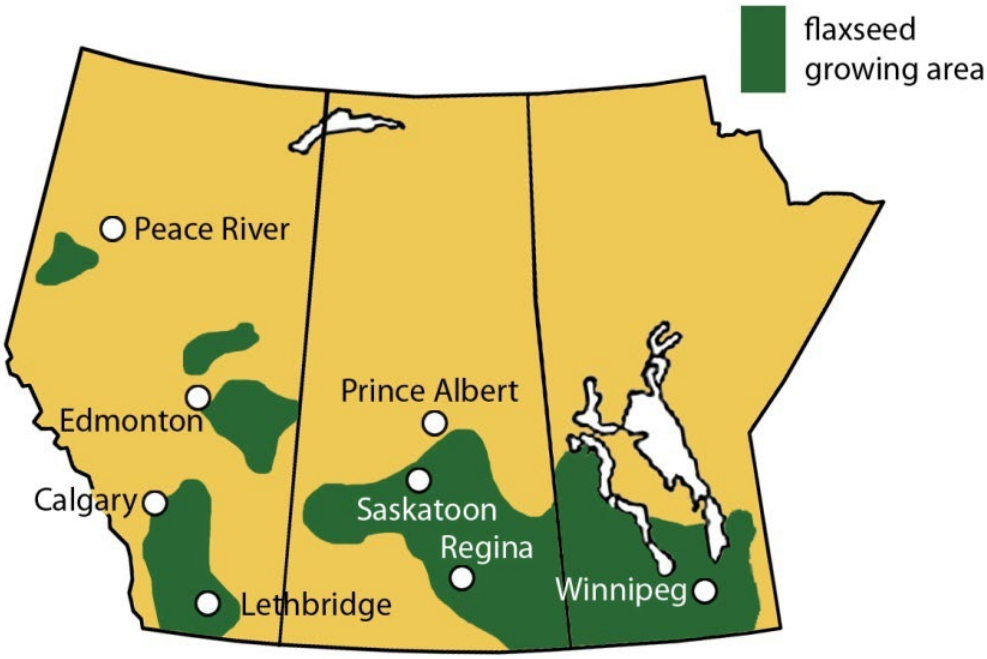


Table 1 Quality data for 2025 harvest samples of brown flaxseed graded No. 1 CW

Quality parameter	2025	2024	2020 to 2024 mean
Number of samples	114	78	182
Oil content[1], %	45.1	44.5	44.8
Protein content[2], %	23.1	24.7	24.6
Free fatty acids, %	0.3	0.2	0.2
Iodine value, units in oil	191.3	192.0	188.7

Table 2 Main fatty acid composition for 2025 harvest samples of brown flaxseed graded No. 1 CW

Fatty acid[3], % in oil	2025	2024	2020 to 2024 mean
Palmitic acid (C16:0)	5.0	5.0	5.1
Stearic acid (C18:0)	3.1	3.2	3.5
Oleic acid (C18:1)	19.0	18.2	19.2
Linoleic acid (C18:2)	14.8	15.2	15.4
Alpha-linolenic acid (C18:3)	57.0	57.2	55.5

[1] Calculated on a dry matter basis.
[2] Protein content is calculated from nitrogen (N) content using N x 6.25, on a dry matter basis.
[3] Relative fatty acid composition of the oil.

Table 3 Quality data for 2025 harvest samples of yellow flaxseed graded No. 1 CW

Quality parameter	2025	2024	2020 to 2024 mean
Number of samples	16	10	10
Oil content[1], %	46.1	44.9	45.7
Protein content[2], %	24.3	25.6	25.0
Free fatty acids, %	0.3	0.2	0.2
Iodine value, units in oil	195.4	194.3	198.0

Table 4 Main fatty acid composition for 2025 harvest samples of yellow flaxseed graded No. 1 CW

Fatty acid[3], % in oil	2025	2024	2020 to 2024 mean
Palmitic acid (C16:0)	4.7	4.9	4.9
Stearic acid (C18:0)	3.0	3.3	3.3
Oleic acid (C18:1)	17.3	17.4	16.3
Linoleic acid (C18:2)	14.9	14.7	14.2
Alpha-linolenic acid (C18:3)	59.1	58.7	60.3

[1] Calculated on a dry matter basis.
[2] Protein content is calculated from nitrogen (N) content using N x 6.25, on a dry matter basis.
[3] Relative fatty acid composition of the oil.

Weather and production review

Seeding and growing conditions

The 2025 growing season in Manitoba was characterized by uneven amounts of precipitation along with warm temperatures. Most seeding was finished by early June (95%), which was ahead of the five-year average (85%). Precipitation amounts varied across the province, with many regions receiving above normal rainfall. However, the Interlake and parts of the northwest region remained significantly drier. By mid-October, 97% of the harvest had been completed.

In Saskatchewan, the growing conditions varied across the province. Limited soil moisture at the time of seeding led to uneven crop emergence in many areas. By June 2, 97% of the crop had been seeded, compared with 94% at the same point in 2024. Significant rainfall in June and July, combined with cooler temperatures, helped even out crop development as the season progressed. Most of the flaxseed crop was harvested by mid-October.

Warm and dry conditions with adequate soil moisture supported seeding progress in Alberta. By early June, 99% of the crop was seeded, which was ahead of the 5-year average (96%) and the 10-year average (96%). The growing season began with hot, dry weather, followed by cooler temperatures and much needed precipitation that helped improve yield potential. By July 29, 64% of crops were rated in good to excellent condition, greater than the 5-year average (53%) and the 10-year average (57%). Harvest advanced quickly under conditions that remained warm and dry, with 96% of the crop harvested by early October.

Sources:
Manitoba seasonal crop reports
Saskatchewan crop reports
Alberta crop reports

Production and grade distribution

Producers in western Canada seeded 619,200 hectares (ha) of flaxseed in 2025 (Table 5), which was higher than the area seeded in 2024 (203,400 ha). The yield in 2025 was estimated to be 1,824 kilograms per hectare (kg/ha). Flaxseed production in 2025 was 453,100 metric tonnes (MT), which was an increase from 2024 (257,500 MT). Flaxseed production in Manitoba was 28,300 MT (27,700 MT in 2024), production in Saskatchewan was 375,000 MT (196,000 MT in 2024) and production in Alberta was 49,800 MT (33,800 MT in 2024). Compared to previous years, the production of flaxseed trended upward for each province in 2025.

Flaxseed samples were graded by Canadian Grain Commission grain inspectors according to the Official Grain Grading Guide. In 2025, 95% of the submitted brown flaxseed samples from western Canada were graded No. 1, and the remaining 5% were graded No. 2 and No. 3. For yellow flaxseed samples, 85% were graded No. 1, and the remaining 15% were graded No. 2 and No. 3.

The harvest samples collected from each province may not be representative of the actual production or grade distribution. There were, however, enough samples to provide good quality information for each province.

Table 5 Seeded area and production of western Canadian flaxseed in 2025[1]

	Seeded area (thousand hectares)		Production (thousand metric tonnes)		Average production (thousand metric tonnes)
Location	**2025**	**2024**	**2025**	**2024**	**2020 to 2025**
Manitoba	34.3	16.3	28.3	27.7	36.3
Saskatchewan	536.9	169.1	37.5	196.0	293.3
Alberta	48.0	18.0	49.8	33.8	55.4
Western Canada	**619.2**	**203.4**	**453.1**	**257.5**	**385.0**

[1] Source: Statistics Canada. Estimated areas, yield, production, average farm price and total farm value of principal field crops, in metric and imperial units

Harvest samples

Flaxseed samples received by the Harvest Sample Program were cleaned to remove dockage prior to testing. Individual samples were analyzed for oil content, protein content and iodine value using a FOSS DS2500 scanning near-infrared spectrometer, calibrated to and verified against the appropriate reference methods. Composite samples were used for more precise and detailed analyses of free fatty acids and fatty acid composition. A brown flaxseed composite and a yellow flaxseed composite were prepared by combining the samples graded No. 1 from each province.

The 2025 flaxseed report is based on 120 brown flaxseed samples, compared to 78 in 2024. Eight samples of brown flaxseed graded No. 1 came from Manitoba, 91 samples came from Saskatchewan and 15 samples came from Alberta. The 2025 report is also based on 20 samples of yellow flaxseed, 17 of which were graded No. 1. One sample of yellow flaxseed graded No. 1 came from Manitoba and 16 samples came from Saskatchewan.

Quality data by province

Information on the quality of No. 1 brown flaxseed from western Canada is found in Table 6 and Table 7 and information on the quality of No. 1 yellow flaxseed from western Canada is found in Table 8 and Table 9.

Alpha-linolenic acid, an omega-3 fatty acid found in flaxseed, can play a role in maintaining good health in humans and animals. It is the main reason for the increased use of whole and ground flaxseed in cereals and baked goods. Flaxseed is also used as a source of oil and protein in animal feed, which can in turn benefit humans. For example, flaxseed incorporated into chicken feed can result in hens producing eggs that are high in omega-3 fatty acid.

Iodine value is a measure of the overall unsaturation of an oil and is calculated from the fatty acid composition. Oils with higher iodine values are more unsaturated and polymerize more rapidly in the presence of air. Iodine value is directly related to the amount of alpha-linolenic acid in flaxseed oil. Alpha-linolenic acid is one of the most important quality factors for flaxseed oil used for industrial purposes because it is responsible for most of the oil's drying properties.

Table 6 Oil content, protein content and iodine value for 2025 harvest samples of brown flaxseed graded No. 1 CW

Grade	Location	Number of samples	Oil content[1], %			Protein content[2], %			Iodine value, units		
			Mean	Min[3]	Max[4]	Mean	Min	Max	Mean	Min	Max
Flaxseed, No. 1 CW	Western Canada	**114**	**45.1**	**41.6**	**47.8**	**23.3**	**19.7**	**28.0**	**193.0**	**183.1**	**199.1**
	Manitoba	8	44.6	43.6	46.9	23.7	21.1	25.3	193.0	189.1	197.2
	Saskatchewan	91	45.2	41.6	47.8	23.0	19.7	28.0	190.7	183.1	199.1
	Alberta	15	45.3	43.5	46.7	23.1	20.0	25.2	193.4	188.9	198.5

Table 7 Fatty acid composition and free fatty acid content for 2025 harvest samples of brown flaxseed graded No. 1 CW

Grade	Location	Number of samples	Fatty acid composition[5], %					Free fatty acids, %
			C16:0	C18:0	C18:1	C18:2	C18:3	
Flaxseed, No. 1 CW	Western Canada	**114**	**5.0**	**3.0**	**18.8**	**14.2**	**57.9**	**0.3**
	Manitoba	8	4.9	2.7	19.2	13.3	58.7	0.6
	Saskatchewan	91	5.0	3.2	19.1	15.0	56.6	0.3
	Alberta	15	5.0	3.1	18.2	14.3	58.4	0.1

[1] Calculated on a dry matter basis.
[2] Protein content is calculated from nitrogen (N) content using N x 6.25, on a dry matter basis.
[3] Min = minimum.
[4] Max = maximum.
[5] Percentage of the main fatty acids in the oil, including palmitic acid (C16:0), stearic acid(C18:0), oleic acid (C18:1), linoleic acid (C18:2) and alpha-linolenic acid (C18:3).

Table 8 Oil content, protein content and iodine value for 2025 harvest samples of yellow flaxseed graded No.1 CW

Grade	Location	Number of samples	Oil content[6], %			Protein content[7], %			Iodine value, units		
			Mean	Min[8]	Max[9]	Mean	Min	Max	Mean	Min	Max
Flaxseed, No. 1 CW	Saskatchewan	16	46.1	43.6	48.5	24.3	22.4	27.2	195.4	183.6	212.3

Table 9 Fatty acid composition and free fatty acid content for 2025 harvest samples of yellow flaxseed graded No. 1 CW

Grade	Location	Number of samples	Fatty acid composition[10], %					Free fatty acids, %
			C16:0	C18:0	C18:1	C18:2	C18:3	
Flaxseed, No. 1 CW	Saskatchewan	16	4.7	3.0	17.3	14.9	59.1	0.3

[6] Calculated on a dry matter basis.
[7] Protein content is calculated from nitrogen (N) content using N x 6.25, on a dry matter basis.
[8] Min = minimum.
[9] Max = maximum.
[10] Percentage of the main fatty acids in the oil, including palmitic acid (C16:0), stearic acid(C18:0), oleic acid (C18:1), linoleic acid (C18:2) and alpha-linolenic acid (C18:3).

Oil content

In 2025, the mean oil content for brown flaxseed graded No. 1 was 45.1%, higher then the 2024 mean (44.5%) and the 5-year mean of 44.8% (Figure 2). The mean oil content for samples from Manitoba was 44.6%, lower than Saskatchewan (45.2%) and Alberta (45.3%). The oil content for No. 1 brown flaxseed from western Canada ranged from 41.6% to 47.8% (Table 6).

The mean oil content for yellow flaxseed was 46.1%, higher than the oil content for brown flaxseed. All but one of the yellow flaxseed samples originated from Saskatchewan. The oil content for No. 1 yellow flaxseed from western Canada ranged from 43.6% to 48.5% (Table 8).

Protein content

In 2025, the mean protein content for brown flaxseed graded No. 1 was 23.1%, lower than the 2024 mean (24.7%) and the 5-year mean of 24.6% (Figure 3). The mean protein content for samples from Manitoba was 23.7%, slightly higher than for samples from Saskatchewan (23.0%) and Alberta (23.1%). The protein content for No. 1 brown flaxseed from western Canada ranged from 19.7% to 28.0% (Table 6).

The mean protein content for yellow flaxseed was 24.3%, higher than the protein content for brown flaxseed. The protein content for No. 1 yellow flaxseed from western Canada ranged from 22.4% to 27.2% (Table 8).

Free fatty acid content

In 2025, the mean free fatty acid content for brown flaxseed graded No. 1 was 0.3%. This was higher than the mean in 2024 (0.2%) and the 5-year mean of 0.2% (Figure 4). The mean free fatty acid content for samples from Manitoba was 0.6%, higher than Alberta (0.1%) and Saskatchewan (0.3%) (Table 7).

The mean free fatty acid content for yellow flaxseed was identical to brown flaxseed (0.3%) (Table 9).

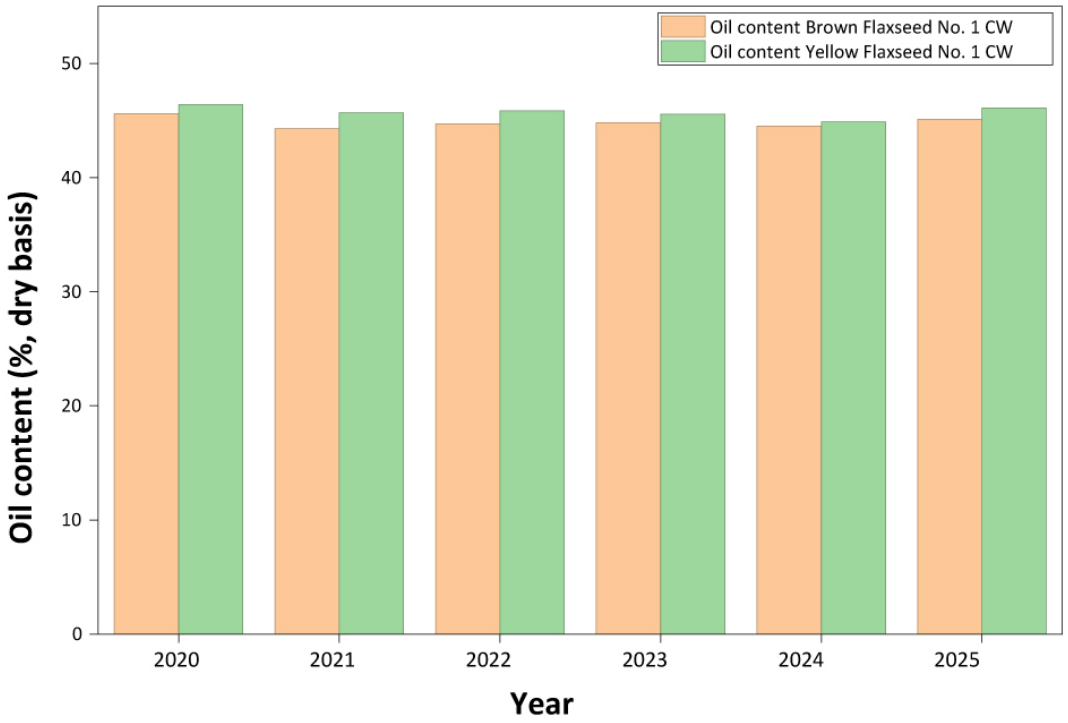
Fatty acid composition

In 2025, the mean alpha-linolenic acid (C18:3) content for brown flaxseed graded No. 1 was 57.0%. This was similar to the 2024 mean (57.2 %) and higher than the 5-year mean of 55.5% (Figure 5). The mean alpha-linolenic acid (C18:3) content values for samples from Manitoba, Saskatchewan and Alberta were 58.7%, 56.6% and 58.4%, respectively.

In 2025, the mean iodine value for brown flaxseed graded No. 1 was 191.3 units. This was lower than in 2024 (192.0 units) and higher than the 5-year mean (188.7 units) (Figure 6).

For yellow flaxseed, the mean alpha-linolenic acid (C18:3) content was 59.1% and the mean iodine value was 195.4 units.

Figure 2 Oil content (%, dry basis) for harvest samples of brown and yellow Flaxseed, No. 1 CW, from 2020 to 2025



Brown flaxseed

2025 mean …….45.1%

2024 mean …….44.5%

2020 to 2024 mean ……..44.8%

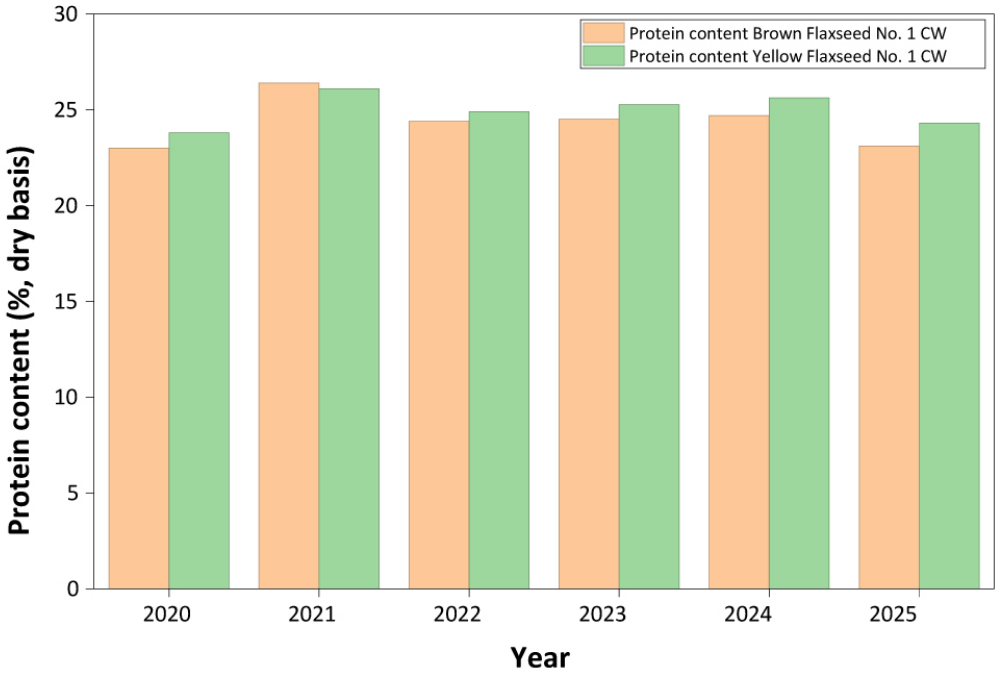
Yellow flaxseed

2025 mean …….46.1%

2024 mean …….44.9%

2020 to 2024 mean …….45.7%

Figure 3 Protein content (%, dry basis) for harvest samples of brown and yellow Flaxseed, No. 1 CW, from 2020 to 2025



Brown flaxseed

2025 mean ……23.1%

2024 mean ……24.7%

2020 to 2024 mean 24.6%

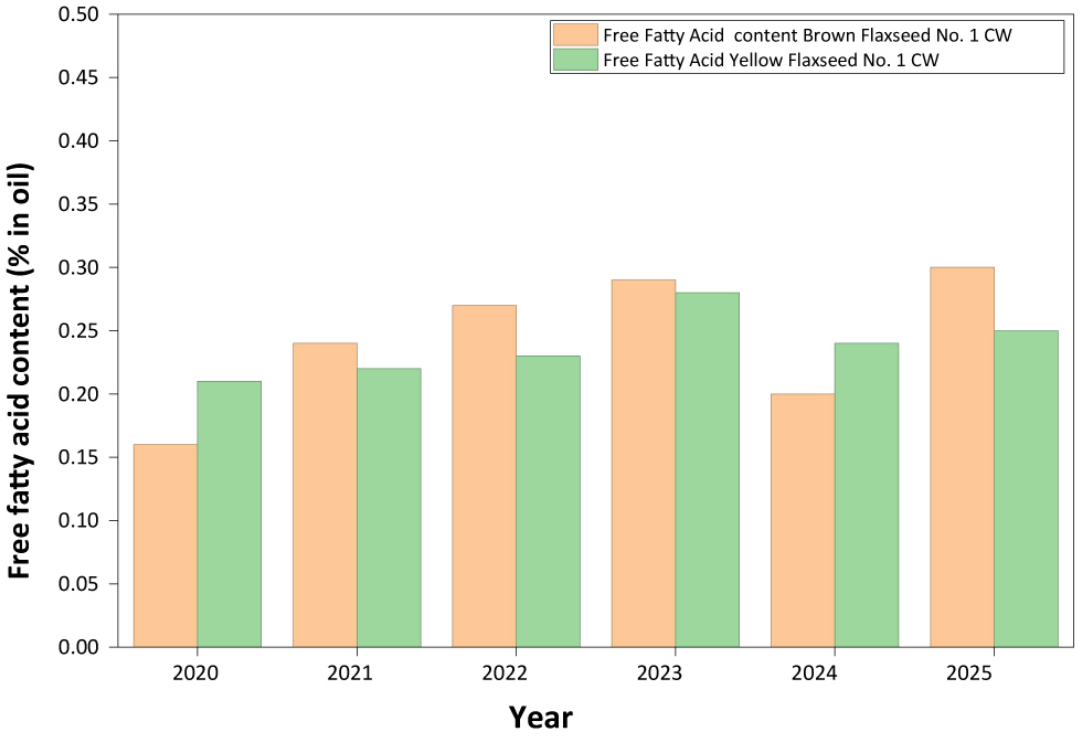
Yellow flaxseed

2025 mean ……24.3%

2024 mean ……25.6%

2020 to 2024 mean ……25.1%

Figure 4 Free fatty acid content (% in oil) for harvest samples of brown and yellow Flaxseed, No. 1 CW, from 2020 to 2025



Brown flaxseed

2025 mean ……0.3%

2024 mean ……0.2%

2020 to 2024 mean ……0.2%

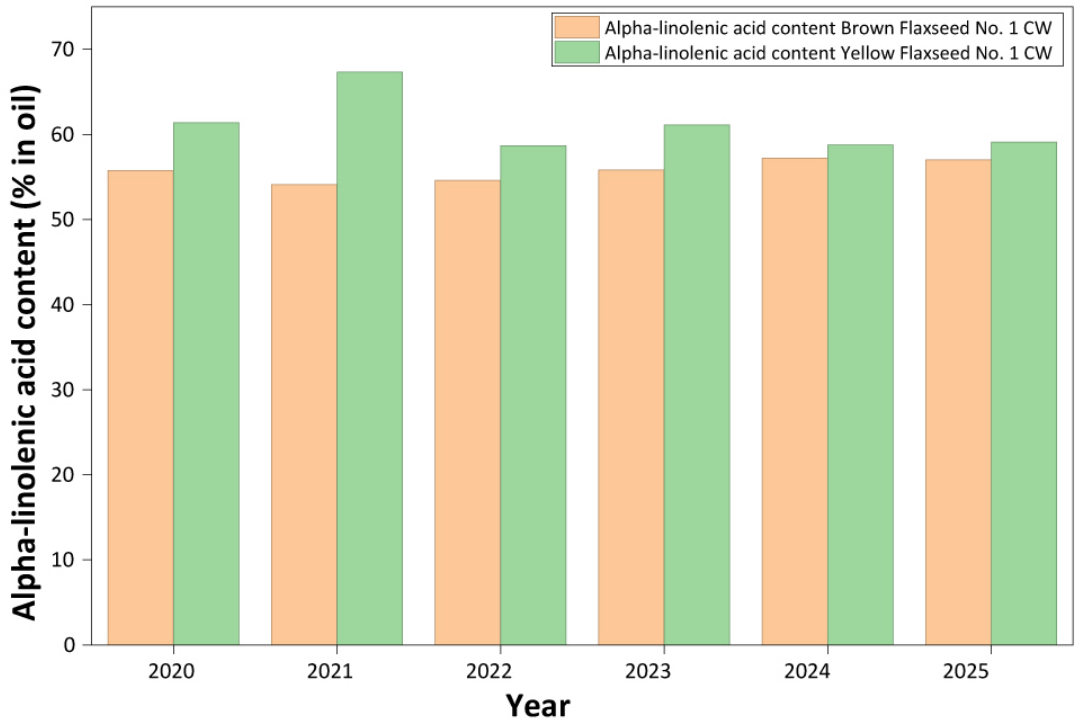
Yellow flaxseed

2025 mean ……0.3%

2024 mean ……0.2%

2020 to 2024 mean ……0.2%

Figure 5 Alpha-linolenic acid content (% in oil) for harvest samples of brown and yellow Flaxseed, No. 1 CW, from 2020 to 2025



Brown flaxseed

2025 mean 57.0%

2024 mean 57.2%

2020 to 2024 mean 55.5%

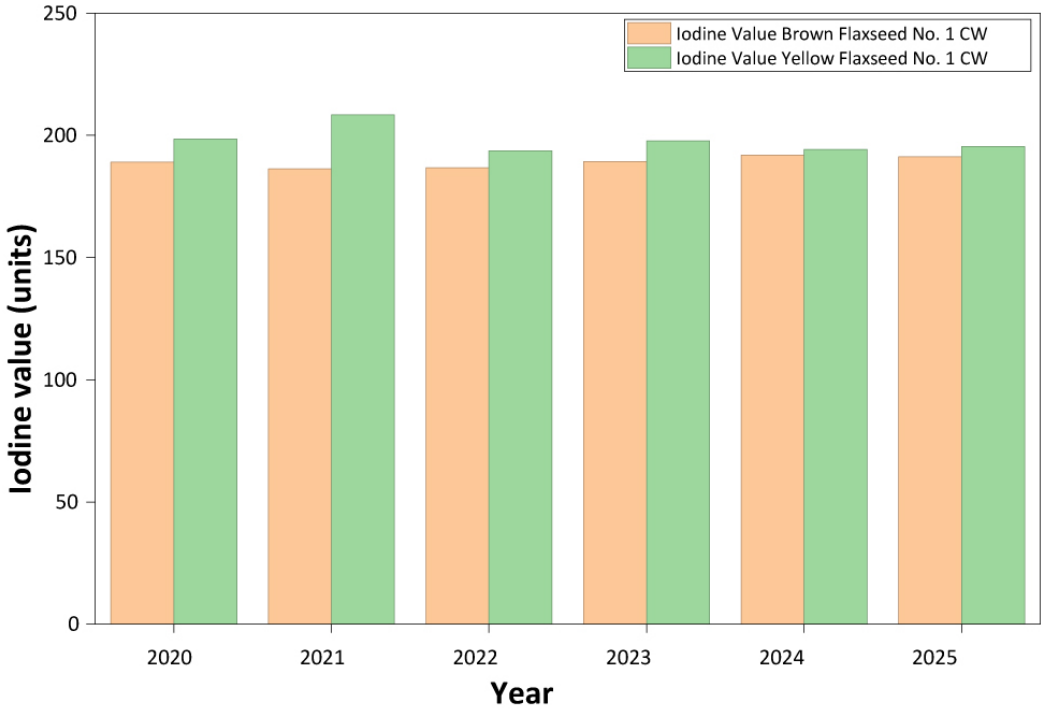
Yellow flaxseed

2025 mean 59.1%

2024 mean 58.7%

2020 to 2024 mean 60.3%

Figure 6 Iodine value (units) for harvest samples of brown and yellow Flaxseed, No. 1 CW, from 2020 to 2025



Brown flaxseed

2025 mean .....191.3 units

2024 mean .....192.0 units

2020 to 2024 mean .....188.7 units

Yellow flaxseed

2025 mean .....195.4 units

2024 mean .....194.3 units

2020 to 2024 mean .....198.5 units