

A detailed line drawing of a cannabis plant with serrated leaves and a large, dense cluster of buds at the top, rendered in a light green color against a darker green background.

Ontario cannabis study shows illegal cannabis fails to deliver the goods

Introduction



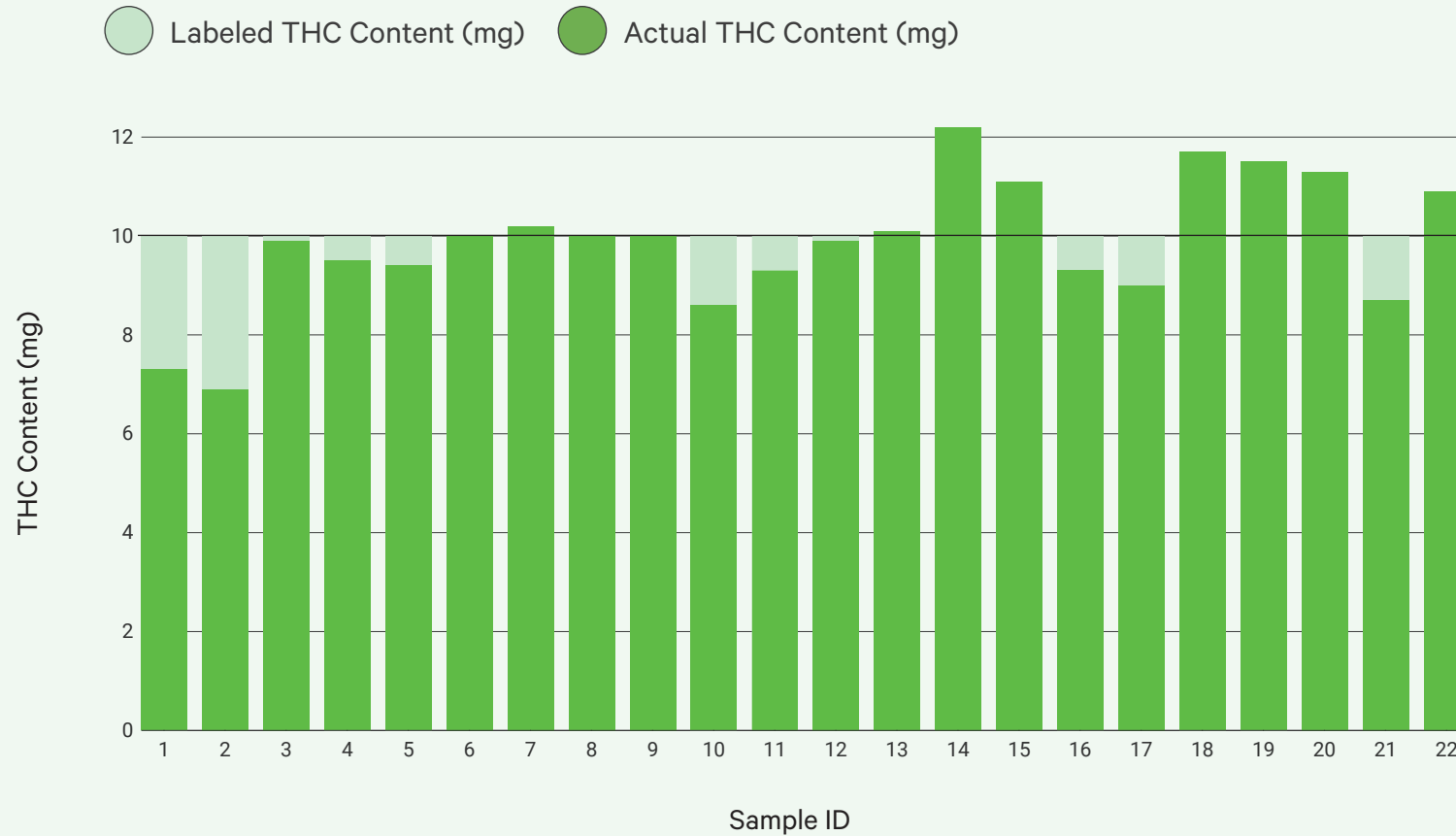
When it comes to cannabis, illegal edibles are not only a bad deal, they are a risky choice compared to those offered through the legal market. According to a study conducted by the National Research Council Canada (NRC) on behalf of the Ontario Cannabis Store (OCS) and Ontario Provincial Police (OPP), legal cannabis edibles are proven to consistently deliver what is promised to consumers. Products on offer through the illegal market shortchanged consumers on Tetrahydrocannabinol (THC) – the psychoactive substance in cannabis – and included high levels of pesticides.

A total of 44 products were tested, with 22 legal products purchased from OCS and 22 illegal products seized by the OPP Provincial Joint Force Cannabis Enforcement Team (PJFCET) during cannabis enforcement investigations. Analysis showed the illegal samples varied broadly in both package size and THC content, containing between 0.1 mg/g and 8 mg/g of THC, and none of the illegal samples came close to delivering what was advertised on the label.

Legal Edibles: Labeled VS Actual THC Content



Health Canada's legal THC limit for cannabis edibles is 10mg. Test results demonstrated that the legal products displayed a high degree of accuracy.



Key findings on the THC content for illegal edible cannabis products:



Most illegal products had **less than 20%** of the advertised THC levels. This high variability in the illegal samples results in drastically different THC levels, making decisions on safe portion sizes impossible.

Some illegal samples contained up to **50 times below** the advertised levels.

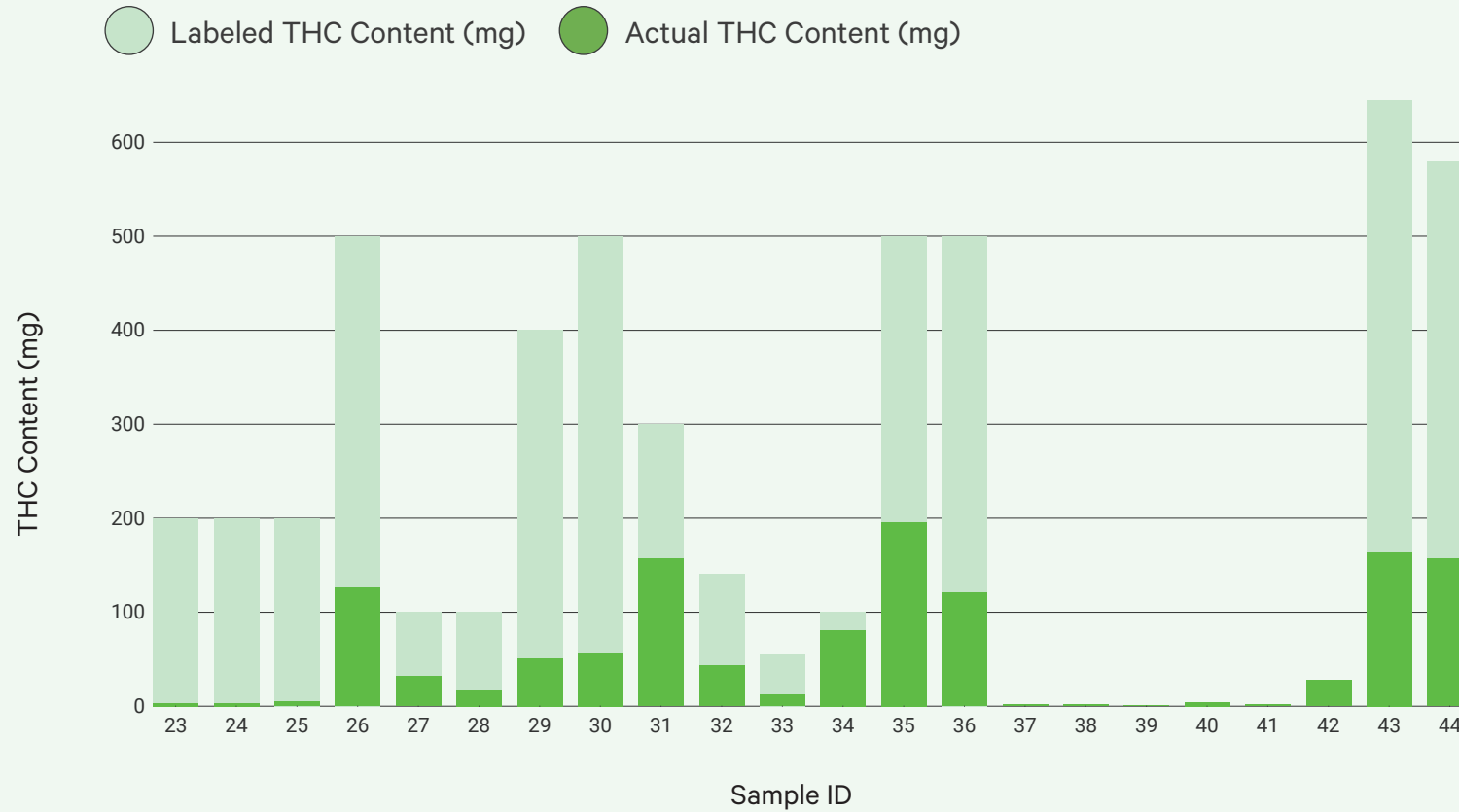
Six of the illegal edible samples **did not state THC levels** on their packaging.

Several illegal samples contained **very small amounts** of THC (< 0.2 mg), and experiments determined that THC was only present on the surface of the edible, indicating the products may have been produced by spraying THC onto existing commercial products.

Illegal Edibles: Labeled VS Actual THC Content



These findings show that when consumers purchase illegal market products, they are not receiving the products or value they expect.



Illegal Edibles: Labeled VS Actual THC Content



Sample ID	Labeled THC content (mg)	Actual THC content (mg)
23	200	3.53
24	200	3.25
25	200	4.54
26	500	126
27	100	32.1
28	100	17.1
29	400	51
30	500	56.2
31	300	157
32	140	43.2
33	55	12.4
34	100	80.8
35	500	196
36	500	121
37	-	2.06
38	-	1.86
39	-	0.992
40	-	4.18
41	-	1.65
42	-	27.6
43	645	164
44	579	157

Hyphens indicate the samples were not labelled with any information on cannabis potency.

Pesticides Present in Illegal Edible Samples



The NRC also performed pesticide analysis for 96 pesticides listed in the *Health Canada Mandatory cannabis testing for pesticide active ingredients – Requirements*¹. Results showed that 86% (19 out of 22) of the illegal samples tested contained multiple pesticides, such as piperonyl butoxide, myclobutanil, and permethrins, some of which were several hundred times above the established Health Canada limit. One illegal sample contained ten different pesticide residues, and the majority of illegal products contained at least two pesticides. By contrast, only two of the legal samples were found to contain trace levels of pesticides, very near or below the limits established by Health Canada.

The testing results of the illegal edible cannabis products echo the findings of an earlier study conducted by the NRC on behalf of the OPP, which found that illegal dried flower samples contained high levels of pesticides including myclobutanil, a dangerous toxic compound that can be linked to various cardiovascular, respiratory and neurological illnesses.

The THC levels in the seized vape products were also typically much lower than advertised. While the majority of the illegal vape samples did not indicate THC levels on their packaging, the six samples with labels claimed to have THC levels greater than 90% but in actuality, contained roughly 50%.

Illegal edibles also put children and youth at risk, as they have no child-resistant features and may be packaged to look like popular brands of candies, snacks or other food products that are typically sold at grocery stores, gas stations and corner stores. These products can be easily confused for non-cannabis products and result in poisonings.

Pesticides Present in Illegal Edible Samples: Soft Chews



Identified Pesticides (parts per billion)												
Chemical Substance Tested:	Product Sample Number											
	23	24	25	26	27	28	29	30	31	32	33	34
Daminozide	-	-	-	-	-	-	-	-	-	7.8	-	-
Azoxystrobin	-	-	-	-	-	-	-	-	150	-	-	-
Paclobutrazol	-	-	-	-	14	-	-	-	24	16	15	-
Myclobutanil	44	150	63	-	650	-	-	-	950	390	340	-
Bifenazate	-	-	-	6.3	-	-	-	-	26	280	-	-
Propiconazole	-	-	-	-	-	-	-	-	410	-	-	-
Tebuconazole	-	-	-	-	-	-	-	-	11	-	-	-
Piperonyl butoxide	-	-	-	-	-	-	220	-	140	250	15	-
Pyridaben	-	-	-	6.5	-	-	-	-	31	-	-	-
Permethrins	-	-	-	-	-	-	-	-	3600	-	180	-
Pyrethrins	-	-	-	-	-	-	34	-	32	-	-	-

Hyphens indicate that the associated analyte was not detected above the lower limit of quantitation.

Pesticides Present in Illegal Edible Samples: Chocolate Products



Identified Pesticides (parts per billion)										
Chemical Substance Tested:	Product Sample Number									
	35	36	37	38	39	40	41	42	43	44
Dodemorph	-	-	11	9.3	-	15	4.8	16	-	-
Metalaxyl	-	-	-	-	-	-	-	-	6.6	6.8
Azoxystrobin	-	-	-	-	-	-	-	-	8.9	8.5
Paclobutrazol	-	-	52	48	33	67	22	72	7.2	7.0
Boscalid	-	-	-	-	-	-	-	-	370	390
Myclobutanil	-	-	1800	1700	1700	2300	1100	2600	41	44
Pyraclostrobin	-	-	-	-	-	-	-	-	170	170
Buprofezin	-	-	11	8.1	-	-	-	-	-	-
Piperonyl butoxide	70	62	-	-	-	-	-	6.4	-	-
Etoxazole	9.6	-	-	-	-	-	-	-	-	-
Acequinocyl	160	150	-	-	-	-	-	-	-	-

Hyphens indicate that the associated analyte was not detected above the lower limit of quantitation.

Conclusion



When adult consumers purchase from the legal cannabis market, they can be confident they are making informed decisions about the products they are ingesting. All legal cannabis products are subject to strict and rigorous testing for harmful and banned substances, and each regulated product requires a Certificate of Analysis (COA) and a Statement of Attestation (SOA) traceable to the product lot number. Despite the legal and regulatory checks, if a legal product is found to be non-compliant with the Health Canada cannabis standards, it can be identified and recalled through its batch and lot numbers. It's also necessary to note that legal cannabis products must be sold in child-resistant packaging which protects against accidental consumption and must not be appealing to youth, unlike illegal products which are not sold in child-resistant packaging.

To help ensure that cannabis products sold in Ontario meet federal guidelines, the OCS Quality Assurance (QA) department has additional measures in place. For example, the OCS QA team double-checks to confirm that the Certificate of Analysis (COA) for each product is present and valid, that the risk of accidental consumption by children is minimized, and that damaged products are removed from the supply chain.

Purchasing legal cannabis is the only way to ensure the product has met the regulatory requirements set out by the government of Canada. It is also the best way to protect against the risk of accidental consumption by children due to Health Canada's guidelines around child-resistant packaging. The purchase of cannabis from anywhere other than through an Authorized Retail Store or online at OCS.ca could lead to a fine of up to \$100,000 and/or imprisonment for up to one year. The study provides further evidence that illegal products are often inaccurate, contain multiple pesticides above Health Canada limits and are ultimately not fit for consumption. Additionally, illegal products often do not have child-resistant packaging and pose a greater risk of consumption by children. Adult consumers should only purchase legal, quality-controlled, tested cannabis products in Ontario through an Authorized Retail Store or online at OCS.ca.

