

2022



FACTSHEET ALCOHOL BY VOLUME



ALCOHOL BY VOLUME

Alcohol, also known as ethyl alcohol or ethanol, is an organic chemical compound and the active ingredient in alcoholic beverages. Alcohol is a volatile, flammable, colourless liquid with a pungent taste. Alcohol is naturally produced by the fermentation of glucose (sugar) into ethanol and carbon dioxide by yeast. In alcoholic beverages, the source of sugar most often comes from the raw materials such as natural sugars in fruits or sugarcane, or starch from grains and potatoes which is broken down into fermentable sugars by the enzyme amylase. In some cases, additional sugars may be added to the fermentation.

ALCOHOL BY VOLUME LABELLING & LIMITS

As per the Food and Drug Regulations, all alcoholic beverages containing 1.1% or more alcohol by volume (ABV) must declare the percentage by volume of alcohol contained in the product. The alcohol by volume declaration must be of the product that is sold. The percentage by volume of alcohol must be shown as "X % alcohol by volume" or be abbreviated "X % alc./vol." or "X% alc/vol". Alternatively, the percentage may be in the middle of the declaration and shown preceded by the abbreviation "alc." or "alc" and followed by the abbreviation "vol." or "vol" (e.g., "alc X% vol" or "alc. X% vol.").

The alcohol by volume must be shown on the principal display panel in both English and French. The French translation is "X% d'alcool par volume". When abbreviated, the above statements are fully bilingual.

Both the Food and Drug Act and the Safe Food for Canadians Act prohibit manufacturers to label a product in a manner that is false, misleading, or deceptive or is likely to create the wrong impression regarding the products character, quality, value, quantity, composition, merit, safety or origin or the manufacturing or preparation method. The ABV declared on the label must accurately reflect the ABV of the product. If a beer product has 4.7% alc./vol. declared on the label, however the measured ABV is 5.8% alc./vol., this is an unacceptable discrepancy. Labelling products in a false or misleading manner is a violation of the Food and Drug Act and the Safe Food for Canadians Act.

To ensure labels are not false or misleading, the following ABV tolerances have been established by the NSLC for different product types:

Product Type		ABV Allowance		
		Adherence	Minor Variance	Major Variance
Beer	≤ 4.0% ABV	Less than ± 0.3%	± 0.4% to ± 0.5%	Greater than ± 0.6%
	4.1 – 5.5% ABV	Less than ± 0.5%	± 0.6% to ± 1.0%	Greater than ± 1.1%
	≥ 5.6% ABV	Less than ± 1.0%	± 1.1% to ± 1.5%	Greater than ± 1.6%
Cider	≤ 4.0% ABV	Less than ± 0.3%	± 0.4% to ± 0.5%	Greater than ± 0.6%
	4.1 – 5.5% ABV	Less than ± 0.5%	± 0.6% to ± 1.0%	Greater than ± 1.1%
	5.6% – 13% ABV	Less than ± 1.0%	± 1.1% to ± 1.5%	Greater than ± 1.6%
Ready to Drink	≤ 4.0% ABV	Less than ± 0.3%	± 0.4% to ± 0.5%	Greater than ± 0.6%
	4.1 – 5.5% ABV	Less than ± 0.5%	± 0.6% to ± 1.0%	Greater than ± 1.1%
	≥ 5.6% ABV	Less than ± 1.0%	± 1.1% to ± 1.5%	Greater than ± 1.6%
Spirits	No macerated fruit/plants	Less than ± 0.3%	± 0.4% to ± 1.9%	Greater than ± 2.0%
	Macerated fruit/plants	Less than ± 1.5%	± 1.6% to ± 2.9%	Greater than ± 3.0%
Wine	Table wine < 14% ABV	Less than ± 1.0%	± 1.1% to ± 1.9%	Greater than ± 2.0%
	Fortified wine > 14% ABV	Less than ± 0.5%	± 0.6% to ± 1.4%	Greater than ± 1.5%

FACTORS INFLUENCING ALCOHOL LEVELS

- **Ingredients and Formula** – The ingredients and formula used largely control alcohol levels. Raw materials will have different sugar contents and some species of yeast are capable of producing and tolerating higher levels of ethanol. For spirits, the alcohol source purchased from approved suppliers can have varying alcohol concentrations.
 - **Process Controls** – Fermentation and ethanol production is affected by several factors including temperature and pH. It is important to keep process controls consistent between production runs to control alcohol levels.
- » Agricultural products added throughout production can influence the alcohol level in finished product.
 - » Some food additives may have an impact on microbial growth and fermentation and therefore influence alcohol levels.
 - » The aging process can influence the alcohol level. If aging takes place in a barrel, a certain volume of the product may evaporate depending on the relative humidity of the environment which may cause an increase or decrease in the alcohol level.

- **Environment** – If processing equipment is not adequately cleaned and sanitized, contaminating yeast, residual sugar, and water from previous production runs may still be present and influence the fermentation in subsequent production runs which may impact alcohol levels.

» Alcohol levels can decrease in wine and ciders contaminated with bacteria (acetic acid or lactic acid bacteria). This can also have other effects on product quality.

CONTROLLING ALCOHOL LEVELS

In any case, where a product is found to be beyond the ABV tolerances, the above factors will need to be taken into consideration.

- Reconsider the ingredients used, modify the formula, or select a different yeast species.
- It is important to purchase raw materials from approved, trusted suppliers and have current product specifications on file.
- External factors such as temperature and pH that affect fermentation or humidity which affects the aging process may need to be monitored and kept consistent to decrease the variability between productions.
- Review the cleaning and sanitation program to ensure the procedures are effective in preventing the risk of contamination from microorganisms or residues.

FOR MORE INFORMATION

If you have questions about the information found in this fact sheet, please contact one of Perennia's specialist at:

Quality and Food Safety

Phone: 902-896-0277

Email: foodsafety@perennia.ca

or

Food and Beverage Innovation Centre

Phone: 902-896-8782

Email: innovation@perennia.ca

If you have questions regarding the established limits or product testing, please contact the NSLC at product.testing@mynslc.com

REFERENCES

Canadian Food Inspection Agency. (2019, January 15). General principles for labelling and advertising – Requirements.

Canadian Food Inspection Agency. (2020, January 29). Labelling requirements for alcoholic beverages – Alcohol by volume declaration.

Fakruddin, M., Quayum, A., Ahmed, M. M., & Choudhury, CN. (2012). Analysis of Key Factors Affecting Ethanol Production by Saccharomyces cerevisiae IFST-072011. Biotechnology, 11(4): 248-252.

Food and Drug Act, RSC 1985, c. F-27.

Food and Drug Regulations, CRC, c. 870.

Jackson, R, S. (2014). Wine Science Principles and Applications. Elsevier.

Maicas, S. (2020). The Role of Yeasts in Fermentation Processes. Microorganisms, 8(8), 1142.

National Center for Biotechnology Information. (n.d.) PubChem Compound Summary for CID 702, Ethanol.

Ribéreau-Gayon, P., Dubourdieu, D., Donèche, B., Lonvaud, A. (2006). Handbook of Enology, The Microbiology of Wine and Vinifications (2nd ed., Vol. 1). West Sussex: John Wiley & Sons, LTD.

Safe Food for Canadians Act, SC 2012, c. 24.

Zohri, A-N, Ramada, A, E-M., El-Tabakh, M., & Al-Tantawy, K. (2015). Key Factors Affecting the Efficiency of Ethanol Fermentation Using Beet Molasses. Egyptian Sugar Journal, 8: 35-32.