

Factsheet

Sorbic Acid



SORBIC ACID

Sorbic acid is an antimicrobial agent used in the food industry. In the production of alcoholic beverages such as wine, cider, and ready to drink (RTD) beverages, it is often used in the form of potassium sorbate which has higher solubility in water compared to sorbic acid. Potassium sorbate is used in alcoholic beverages with residual sugar before bottling to reinforce the action of sulphur dioxide. The main aim is to prevent fermentation in bottles by inhibiting the yeasts.

Sorbic acid, when used appropriately, is generally recognized as a safe agent, due to its lack of toxicity and neutral flavour. However, in some cases, it may cause some side effects such as possible allergies and skin rashes.

Sensory effects on of potassium sorbate for wines and ciders have been reported in various studies. In the case of winemaking, when used in higher concentrations, sorbic acid may modify gustatory characteristics of the product, increasing astringency, bitterness, and harshness. Moreover, when sorbic acid is used without taking measures to limit bacterial growth, lactic acid bacteria can metabolize sorbic acid and produce a molecule called "geranium" which gives an undesirable aroma to the wines. In the case of cidermaking, sensory analyses of apple ciders with added potassium sorbate showed higher intensities of undesirable flavour attributes, such as "cardboard flavour", and lower intensities of the desirable "apple flavour" compared to the apple ciders produced without addition of potassium sorbate.

SORBIC ACID LIMITS

The sorbic acid limit set by The Food and Drug Regulations Division 2 Alcoholic Beverages for the specified alcoholic beverage categories is 500 parts per million, which corresponds to 500 mg/L.

The amount of sorbic acid required to achieve the desired microbial stability changes depending on the chemical parameters of the product. Among these chemical parameters are the alcohol level and residual sugar. Therefore, for wine, cider and RTD, depending on the type and characteristics of the product, limits of sorbic acid have been established by the NSLC.

PRODUCT	SORBIC ACID LIMIT	
	NSLC (ppm - mg/L)	Health Canada Limits (ppm - mg/L)
Wine >9 % ABV or <10 g/L sugar	Less than or equal to 200	Limit 500
Wine <9 % ABV or >10 g/L sugar	Less than or equal to 500	Limit 500
Cider under 10 g/L sugar	Less than or equal to 200	Limit 500
Cider over 10 g/L sugar	Less than or equal to 500	Limit 500
Ready to drink (RTD)	Less than or equal to 500	Limit 500

CONTROLLING SORBIC ACID LEVELS

The following points should be considered when using sorbic acid:

- It is important to understand the application purpose and effects of sorbic acid on the product.
- To determine the amount of sorbic acid needed to achieve the desired microbial stability, it is necessary to have data on the alcohol percentage, pH, residual sugar, and free sulphur dioxide content of the product.
- It is not advisable to use sorbic acid for fermented alcoholic beverages (such as wine and cider) without residual sugar.
- It is not advisable to use sorbic acid without taking measures to limit bacterial growth (such as sulphur dioxide and/or sterile filtration).
- Read the technical data sheet of the sorbic acid provided by the manufacturer and follow the direction of use and recommendations of dosage.
- It is important to keep track of all the additions to the batch of the product to avoid any mistakes and incorrect applications.

REFERENCES

Bartowsky, E. J. (2009). Bacterial spoilage of wine and approaches to minimize it. Letters in Applied Microbiology, 48(2): 149–156.

Boylston T. D., Wang H., Reitmeier C. A., Glatz B. A. (2003). Effects of processing treatment and sorbate addition on the flavor characteristics of apple cider. Journal of Agricultural and Food Chemistry, 51(7):1924-1931.

Dharmadhikari, M. (n.d.). Sorbic Acid. Midwest Grape & Wine Industry Institute.

FDA Food and Drug, 21 C.F.R § 182.3089. (2020).

Food and Drug Regulations, CRC, c. 870.

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.

Silva, M., Cebola Lidon, F. (2016). Food preservatives – An overview on applications and side effects. Emirates Journal of Food and Agriculture 26,(6):366-373.

Sofos, J. N., & Busta, F. F. (2005). Sorbic acid and sorbates. In P. M. Davidson, J. N., Sofos, & A. L. Branen (Eds.), Antimicrobials in Foods (3rd ed., pp. 49–90).

Tromp, A., Agenbach W. A (1981). Sorbic Acid as a Wine Preservative-Its Efficacy and Organoleptic Threshold. South African Journal of Enology and Viticulture, 2(1):2.

Zoecklein, B. W. (n.d.). Controlling Microbial Growth in Wine. Department of Food Science and Technology Virginia Tech.

FOR MORE INFORMATION

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

Quality and Food Safety

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