

# AV – Residual Sugar

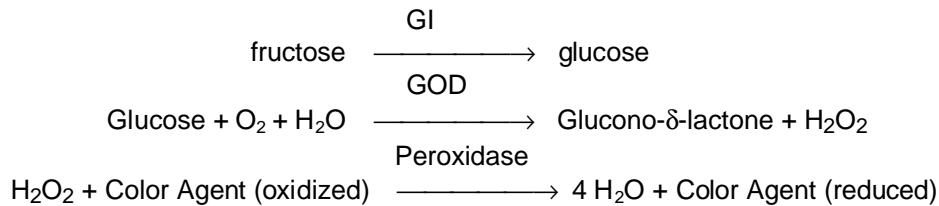
Cat. no. 220

## Intended Use

AV-RS is intended for measuring the levels of residual yeast-fermentable sugar in fermented must and wine.

## Methodology

AV-Residual Sugar is based on the change in color exhibited by a Trinder color indicator during a reaction involving hydrogen peroxide in the presence of the enzyme peroxidase and glucose oxidase.



## Sample

Samples of wine may be used as is. Grape juice and must samples should be diluted 1:20 prior to analysis if the expected value is greater than 2,000 mg/L. Use ACCUVIN Quick Dilute tubes. The ACCUVIN AV-Residual Sugar patent pending test strip removes the usual interferences from colored and turbid samples. Samples do not have to be pre-filtered or treated with color removing substances such as activated carbon or polyamide powder. Sample temperature may be from 0°C - 35°C (32°F - 95°F).

## Procedure

1. Squeeze upper sampler bulb. Dip sampler tip into wine, must or grape juice sample, then release to aspirate sample. (If you prefer to use an air displacement pipette, set sample volume at 20 µL.)
2. Transfer sample to rectangular absorbent layer on back of test strip by squeezing sample bulb. **Apply slight pressure with sampler tip.** Allow sample droplet to absorb into absorbent layer. Note that only sample present in the sampler tip will be dispensed. Wait 2 min. for color development.
3. Determine sample fermentable sugar level in mg/L by comparing the developed color to the color chart on the test strip container. If test strip color falls between two color chips select an intermediate value for the sample residual sugar level. If no color develops yeast fermentable sugars have been depleted. Note that if a sample was diluted prior to analysis using the 1:20 Quick Dilute, the sample residual sugar level is 20 times the level obtained from the color chart. (**Since fluorescent lights have a green cast, color matching is best under incandescent or natural lighting.**)

## Storage

Store away from direct sunlight at temperatures below 80°F. Keep dry. Product is satisfactory until the date printed on the test strip container label.

ACCUVIN, LLC  
 P.O. Box 5328  
 Napa, CA 94581  
 Phone, fax: (707) 255-2029

[www.ACCUVIN.com](http://www.ACCUVIN.com)

for technical inquiries: email: [techinfo@accuvin.com](mailto:techinfo@accuvin.com)

Seller's limitation of liabilities: Every effort has been made to ensure the material contained in this informational insert and the results obtained with AV test strips are as accurate as possible, but no warranty or fitness is implied. Buyer shall not in any event be entitled to, and seller shall not be liable for, indirect, special, incidental or consequential damages of any nature including, without being limited to, loss of profit, promotional or manufacturing expenses, overhead, injury to reputation or loss of customers. Buyers recovery from seller for any claim shall not exceed buyer's purchase price for the products irrespective of the nature of the claim, whether in contract, tort, warranty, or otherwise.

## Interpretation

Residual sugar is that amount of sugar left following completion of primary (alcoholic) fermentation. The residual sugar can vary over a wide range depending primarily on desired wine style and secondarily on characteristics of the original must, e.g., level of titratable acidity. Residual sugar concentrations are important for determining the completeness of fermentation, for sensory characteristics, and for microbial stability of wine. Technically “dry table wines with no fermentable sugar” are typically defined as having a reducing sugar concentration of less than 2 g/L,<sup>2,3</sup> although in a sensory context, the absence of perceived sweetness is achieved at concentrations below 5 g/L.<sup>6</sup>

In white wine production fermentation is initiated after the must has been separated from the skins and seeds. White wine fermentation generally proceeds more slowly than red wine fermentation because it is conducted at lower temperatures. In addition, slower-growing yeasts are sometimes selected to enhance the fruity character of the wines, or to facilitate stopping fermentation at a particular point if residual sugar levels above dryness are desired.

For red wines fermentation takes place in the presence of skins and seeds, and takes place at a higher temperature to enhance color and tannin extraction. For most red wines pressing occurs around 5% residual sugar, and then the fermentation is allowed to continue to desired dryness. This is because almost all color is extracted before alcohol levels reach 10% as are most softer tannins. For maximum tannin extraction fermentation is allowed to finish on the skins. In these instances wines require a long maturation period before they are ready for consumption.

Reducing sugars in wine consist of hexoses (mainly glucose and fructose) and pentoses (mainly arabinose and xylose). The pentoses are not fermentable by wine yeasts.<sup>2</sup> Since pentoses alone can vary from 0.4 to 2.0 g/L,<sup>1,2,7</sup> the best measure of the completion of primary fermentation is the determination of glucose plus fructose.

### Summary Interpretation for Most Wines

(Because of varietal & stylistic differences, growers & winemakers should make final interpretations.)

<u>Residual Sugar</u>	<u>Interpretation</u>	<u>Action</u>
<500 mg/L	Usual range for a “bone dry” wine	No action required
500 – 1,000 mg/L	Typical levels after primary fermentation for a dry wine	No action required
1,000 – 2,000 mg/L	Usual range for an off-dry “semi-dry” table wine	No action if semi-dry wine is desired; otherwise continue fermentation
2,000 – 3,000 mg/L	Usual range for an off-dry “semi-sweet” table wine	No action if semi-sweet wine is desired; otherwise continue fermentation
3,000 – 8,000 mg/L	Usual range for a dessert wine	No action if dessert wine is desired
4,000 – 5,000 mg/L	End of extraction phase for most red wines	Pump red must from lees, press to prevent hydrogen sulfide pick-up

## References

1. Margalit, Y., *Concepts in Wine Chemistry*, The Wine Appreciation Guild, San Francisco, **1997**.
2. Zoecklein, B.W., Fugelsang, K.C., Gump, B.H. and Nury, F.S., *Wine Analysis and Production*, Chapman and Hall, New York, **1995**.
3. Dharmahikari, M, “White wine production,” *Vineyard and Vintage View*, 14(2), 14(3), 14(4), 14(5), 14(6), and 15(1), **1999 – 2000**.
4. Dharmahikari, M, “Red wine production,” *Vineyard and Vintage View*, 15(2), 15(3), 15(4), **2000**.
5. Jackisch, P., *Modern Winemaking*, Cornell University Press, Ithaca, NY **1985**.
6. Cook, R.M., Devlin, B.R., Ebeler, S.E., and Butzke, C.E., “Evaluation of a digital blood gas monitor for measuring residual sugar in wines,” *Am. J. Enol. Vitic.*, 49(2): 225-228 **1998**.
7. Melamed, N., “Détermination des sucres résiduels des vins, leur relation avec la Fermentation Malolactique,” *Ann, Technol. Agric.*, 11 (1): 5 -32 **1962**