CDRWineLab®

The sugar determination in the winemaking process

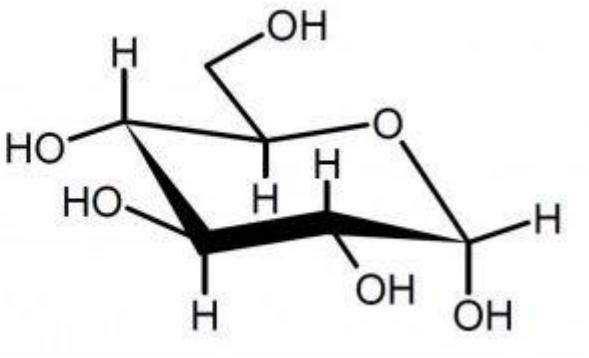
Simone Bellassai – Enologist and CDR WineLab® specialist.

Which are the methods commonly used for the sugar analyses in wine or grape juice? Which are their main issues? What are the differences among the methods used?

Sugar analysis can be normally carried out with:

- **Enzimatic pathway** OIV-MA-AS311-02
- **Cromatography** (HPLC) OIV-MA-AS311-03
- **Reducing substances** OIV-MA-AS311-01A

The quality control of the sugars allows to monitor the normal evolution of the **alcoholic fermentation**. Having an easy and fast method for their determination is a valuable tool available for the winemaker to manage at best the **fermentation process**.



The sugar determination with the enzymatic or chromatographic method (HPLC) allows to determine the fermentable sugars **glucose and fructose** excluding the **pentoses**, sugars with 5 atoms of carbon.

Contrary, the sugar analysis made via **Reducing substances** OIV-MA-AS311-01ª, carried out with a titration, detetcs the fermentable sugars and pentoses as well which are reducing but not assimilable by yeasts during the alcohol fermentation!

The pentoses, chemically speaking, are sugars with 5 atoms of carbon and they are contained in the grape in variable amount based on different factor such as grape variety, soil, latitude etc. The quantity of these sugars can go from 1.0 up to 5.0-6.0 g/L. This fact can be seriously considered when the winemaker detects the end of alcohol fermentation using one of the methods mentioned above.
In the table below there is an example of comparison between the 3 methods used to check the same wine at the end of alcohol fermentation.

	Enzymatic pathway (OIV-MA-AS311-02)	**Reducing substances** (OIV-MA-AS311-01A)	**Cromatography - HPLC** (OIV-MA-AS311-03)
SUGAR analysis	1.5 g/L	4.5 g/L	1.7 g/L

Due to the presence of the pentoses the sugar analysis made via titration (reducing substances) gives normally higher results than cromatography (HPLC) or enzymatic pathway. **This fact must be kept in consideration when the winemaker compares analyses made by different methods**.

Chemically speaking the analysis made via HPLC or using the enzymatic pathway are much better for a better understanding of the end of alcohol fermentation.

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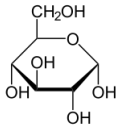
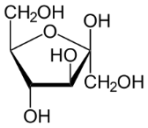
SUGARS analyses with CDR WineLab®

CDR WineLab® sugar analysis is based on the reference method OIV-MA-AS311-02.

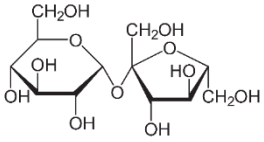
With CDR WineLab® you are able to detect the FERMENTABLE SUGARS:



GLUCOSE



FRUCTOSE



SUCROSE
(If, it is added)

CDR WineLab® reagents for sugars

You can detect the total amount of fermentable sugars (glucose and fructose) all togheter

Fermentable sugars GF

It can be used or not with the **dilution kit for sugars** depending on the sugars level of the sample

Dilution kit for sugars

You can detect the glucose and fructose separately

Glucose and Fructose

It can be used or not with the **dilution kit for sugars** depending on the sugars level of the sample

Dilution kit for sugars

Fermentable sugars GFS

You can detect the total amount of fermentable sugars (glucose and fructose) including sucrose as well

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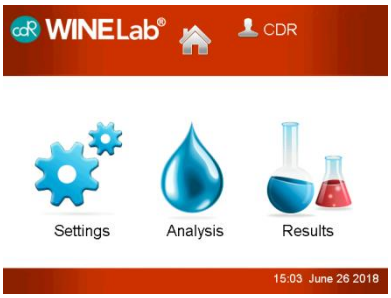
Sugar CURVES on CDR WineLab®

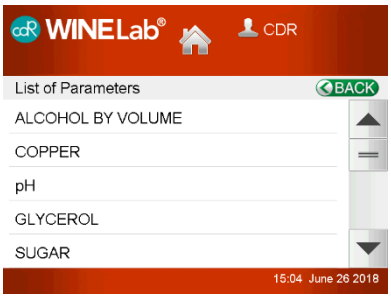
Select

ANALYSIS



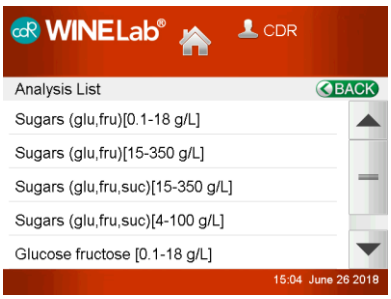
Select

SUGAR



Select

the **CURVE** you need from the list



These are the **CURVES** you find on the analyzer

CDR WineLab Jr®

On the CDR WineLab Jr. is now available the **Glucose and Fructose** analysis. To update your analyzer write an e-mail to our SUPPORT

support@cdrfoodlab.com

SUGAR CURVES on the CDR WineLab®

Sugars (glu, fru) [0.1 – 18] g/L
Sugars (glu, fru) [15 – 350] g/L
Sugars (glu, fru, suc) [15 – 350] g/L
Sugars (glu, fru, suc) [4 – 100] g/L
Glucose fructose [0.1 – 18] g/L
Glucose fructose [15 – 350] g/L

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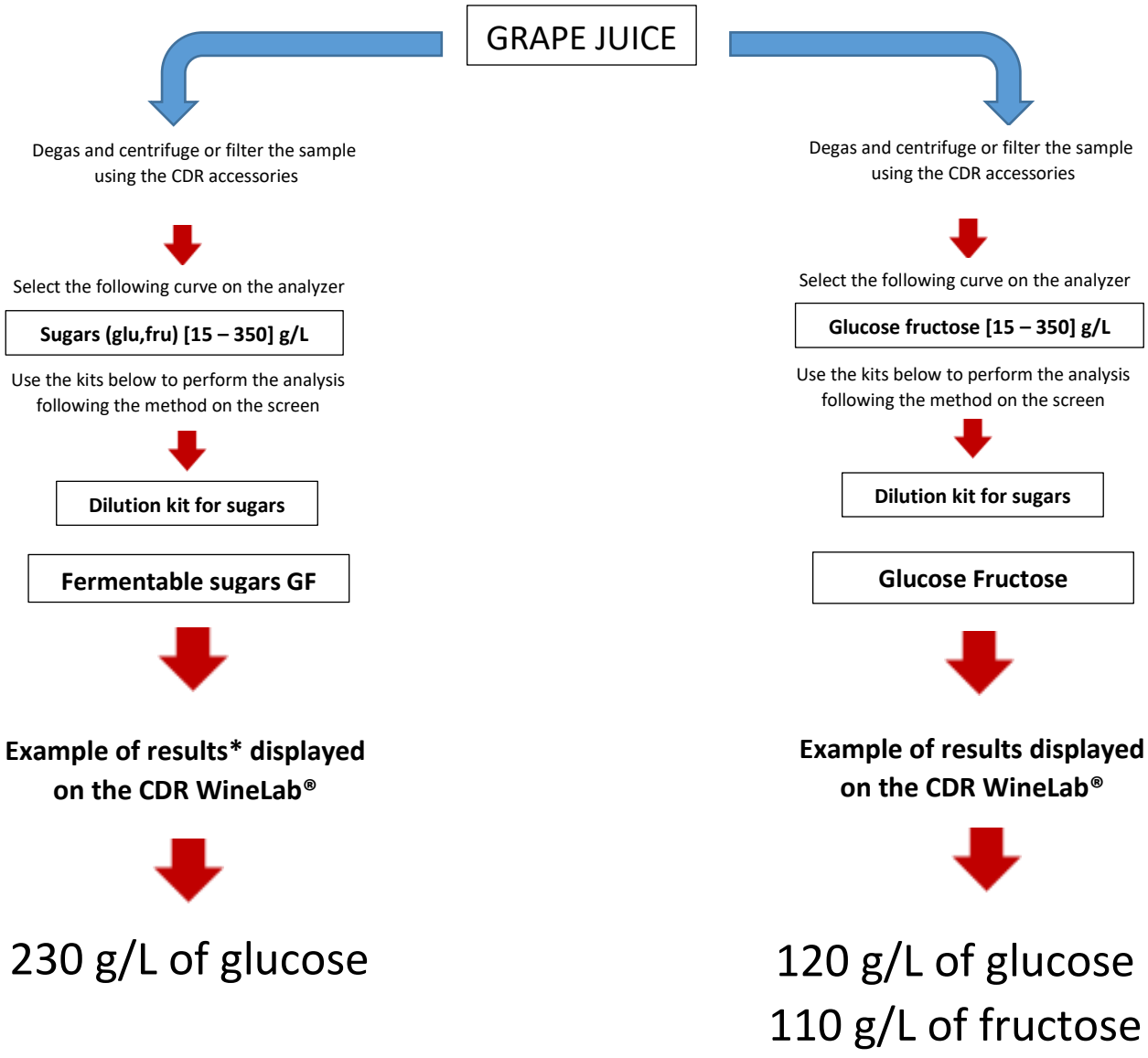
How to combine CDR sugar kits with CDR WineLab® curves

CASE 1. The winemaker needs to know the ripening of the grape to take a decision about the harvest. The same analysis gives him the potential alcohol he will have at the end of alcoholic fermentation.



* In this case "**g/L of glucose"** is only the unit measure to express the result the value include both fermentable sugars glucose and fructose as their sum

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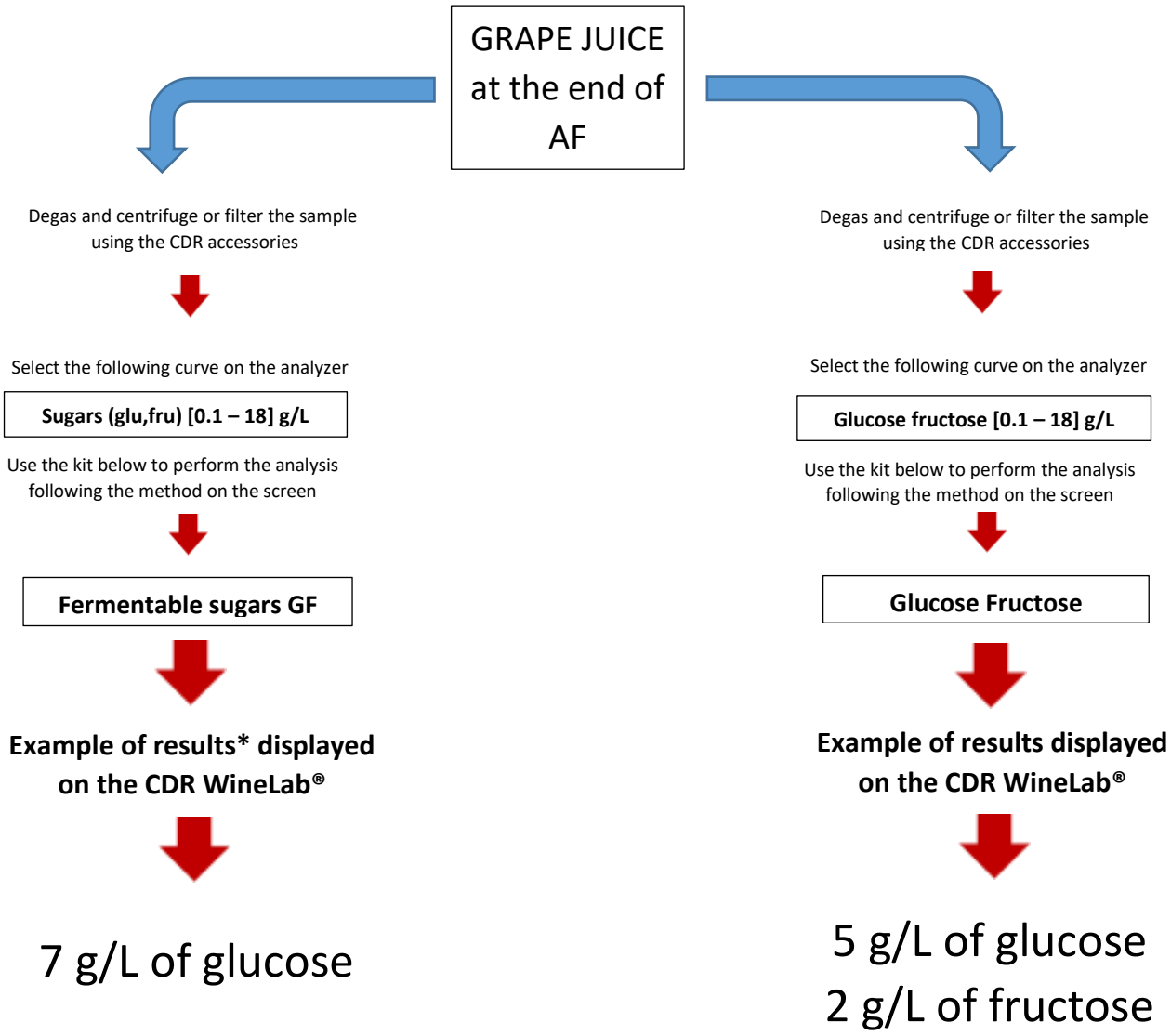
CASE 2. The winemaker wants to know the end of the alcohol fermentation through the sugars value. CDR WineLab® detects only the fermentable sugars (glucose and fructose) so the fermentation is over when you have from the analyser < 0.1 g/L (less than 0.1 g/L).



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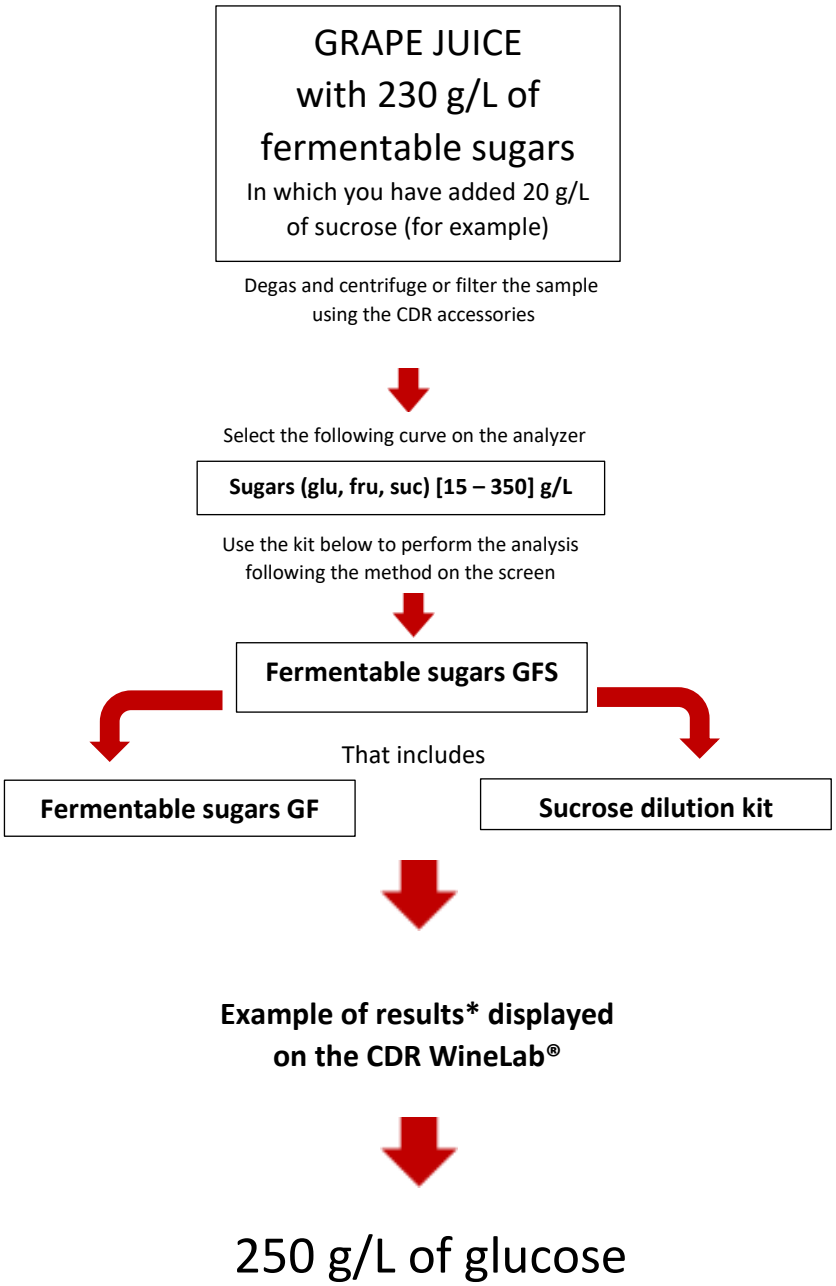
CASE 3. To increase the potential alcohol, in many regions, is allowed to add sucrose. After the addition, to check if it was performed properly the winemaker can analyse the fermentable sugar content (glucose and fructose) including sucrose as well.



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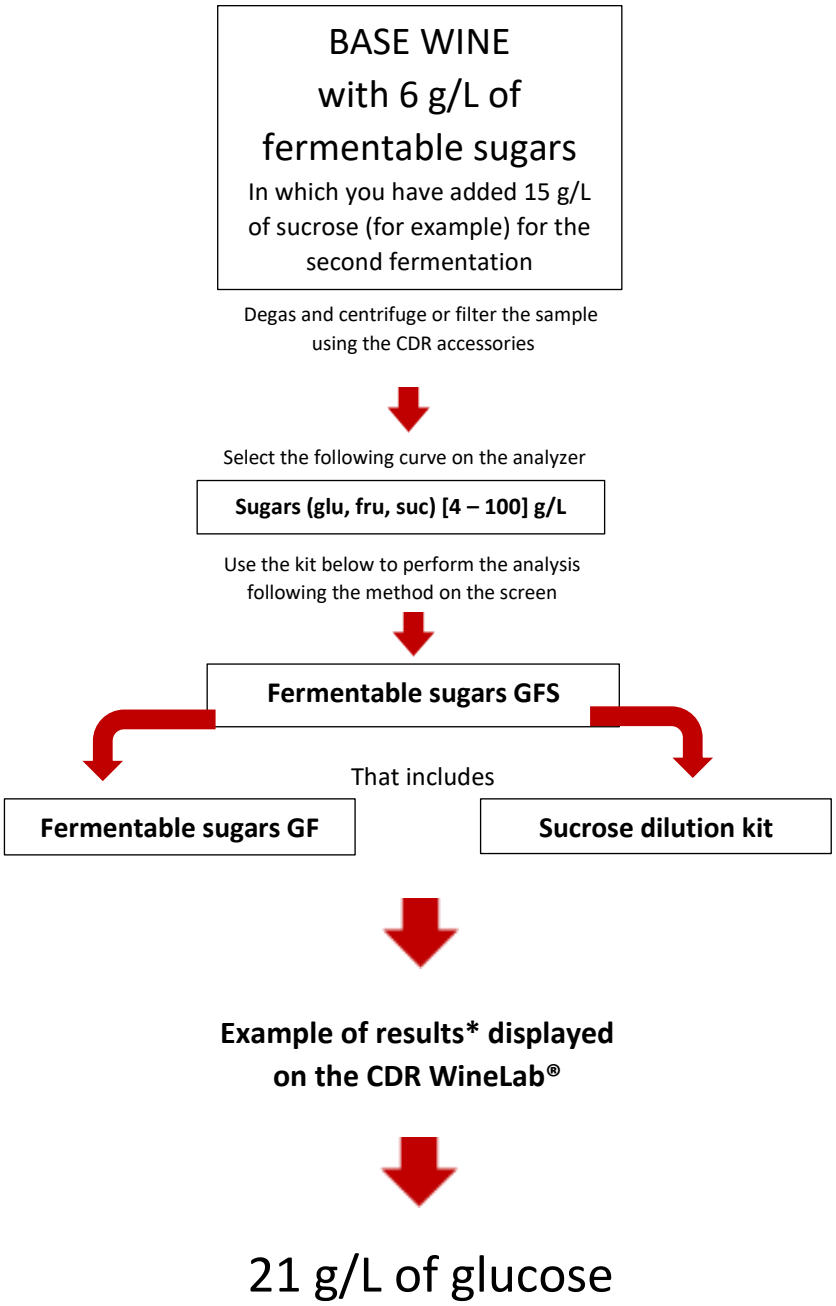
CASE 4. For sparkling wine, it is very important the addition of sugars to make a good second. The sugar added is going to determine the CO2 pressure in the bottle. After the addition, the winemaker can check the total fermentable sugars available in the sample in order to be sure about the correct sugar level in the wine



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CDR WineLab® the analysis system of wine and must

With **CDR WineLab®** you can determine in just a few minutes a wide panel of parameters on **wine as is** and on must with a prior simple preparation optimized by CDR.

CDR WineLab® **optimize traditional methods**: performing the tests is easy and fast, the results are in line with the reference methods.

Parameters on wine and must that you can determine:

- Acetic acid
- Fermentable sugars
- Total acidity
- Lactic acid
- Malic acid
- Malolactic fermentation
- Acetaldehyde (Ethanal)
- Gluconic acid
- Free sulphur dioxide
- Total sulphur dioxide
- Alcohol by volume
- pH
- Yeast Assimilable Nitrogen (YAN) in must
- Glycerol
- Total polyphenols index (IPT)
- Antocyanes
- Intensity and color
- Total polyphenols (Folin Ciocalteu)
- Catechins
- Copper