DEALCOHOLIZED WINES; PROCEDURES AND LEGAL ASPECTS

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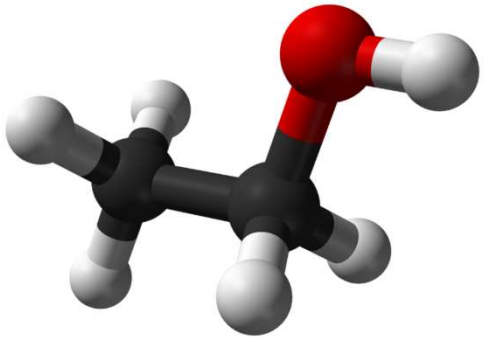
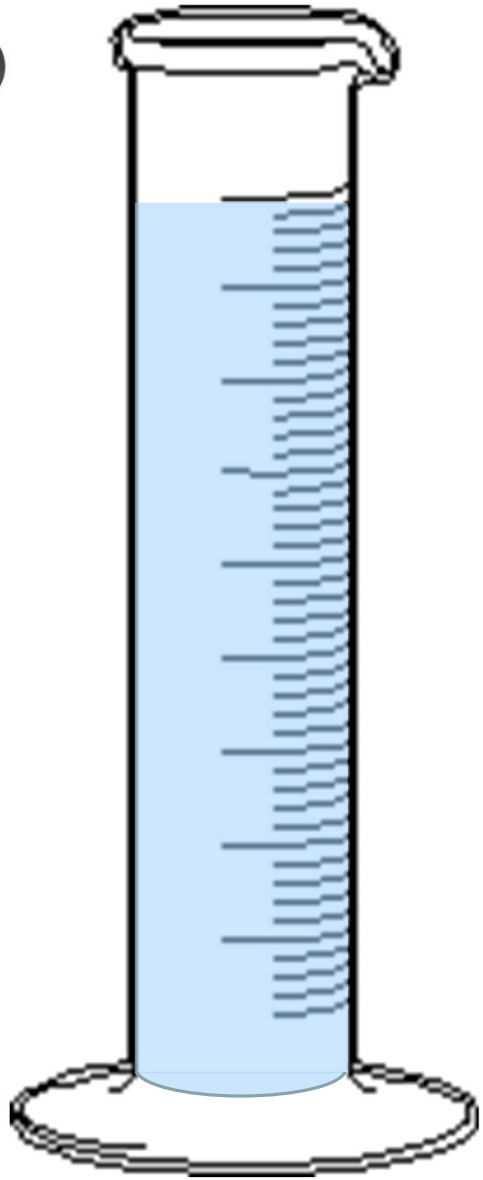
Webinar, March 29, 2023

$CH_3 - CH_2OH$

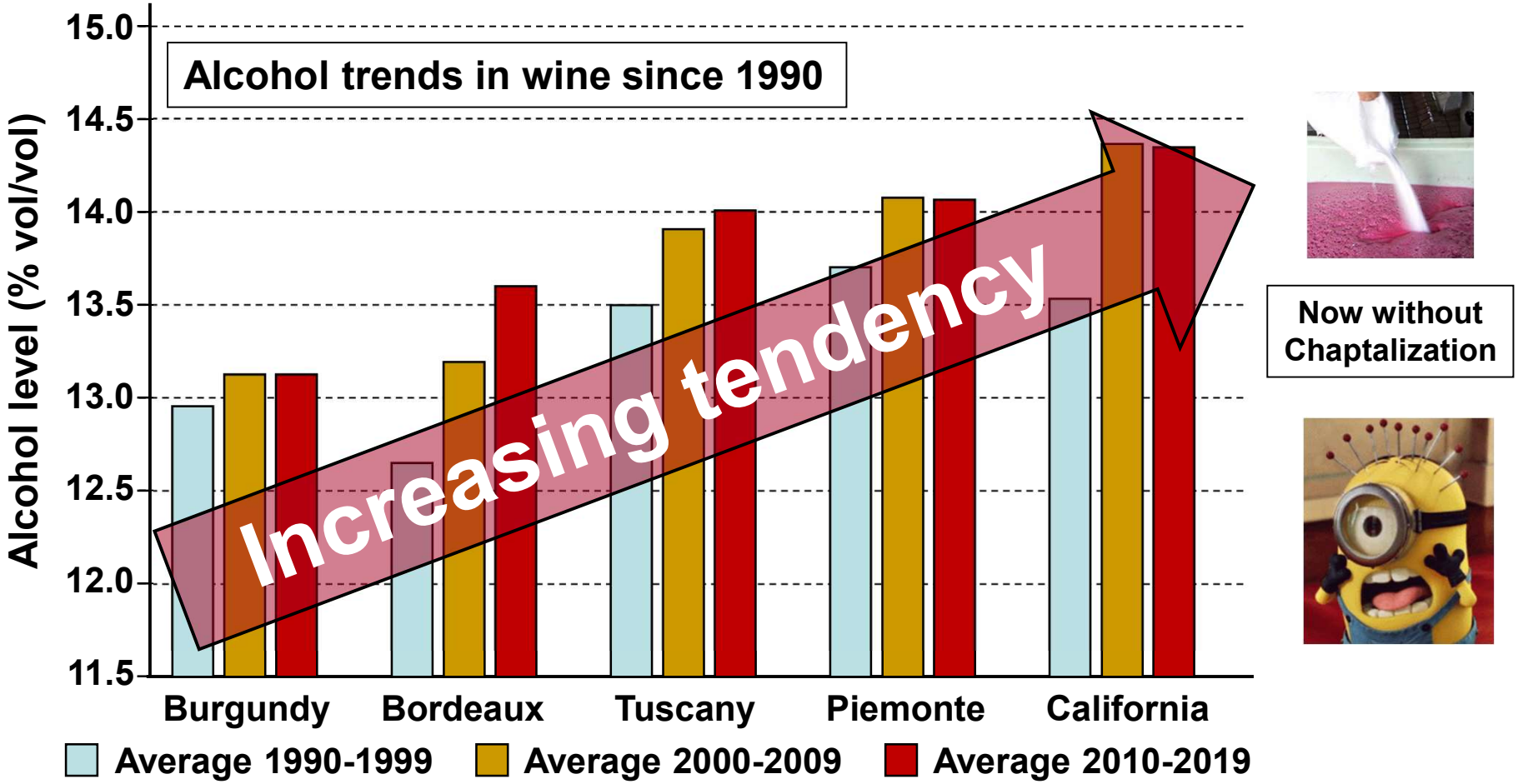
Ethanol



It is an undeniable fact that the alcoholic strength of wines has increased a lot during the last years



Dealcoholized wines; dealcoholized wines; procedures and legal aspects

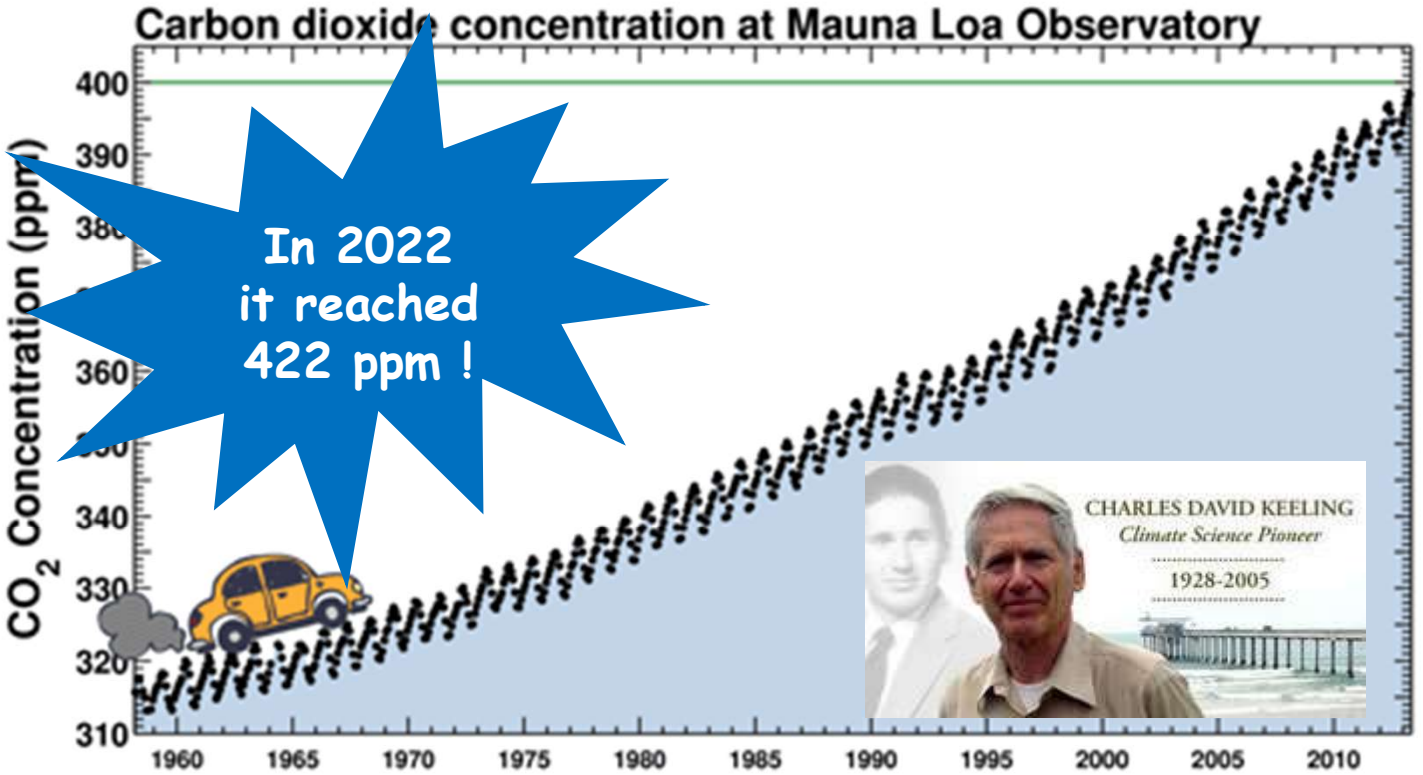


Now without Chaptalization

Chris Mercer
Is alcohol in wine rising? New data released
Decanter, June 20, 2021 https://www.decanter.com/learn/are-alcohol-levels-in-wine-rising-data-460879/

Dealcoholized wines; dealcoholized wines; procedures and legal aspects

The concentration of CO_2 in the atmosphere increases!



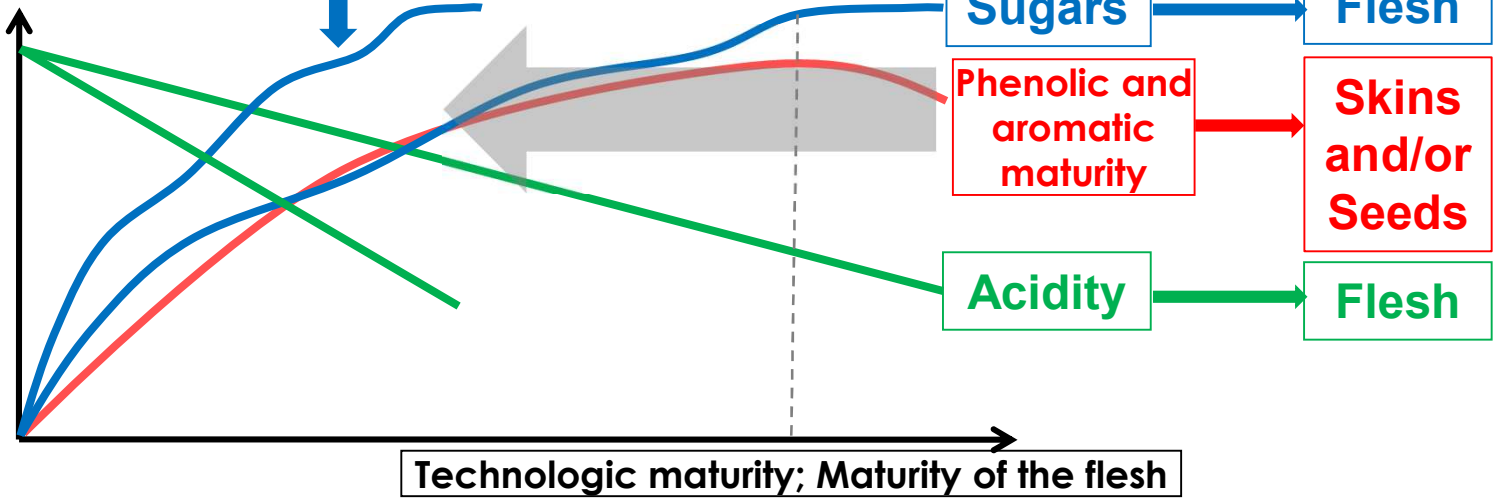
Effects of global warming

An increasing imbalance between technological and phenolic and aromatic ripeness

If we harvest earlier
Red wines: astringency, bitterness and poor color
All wines: vegetal and herbaceous characters; Lack of flowery and fruity aromas

If we wait for the complete maturity
Too High probable alcoholic degree and pH;
Too low titratable acidity

Unripe Seeds



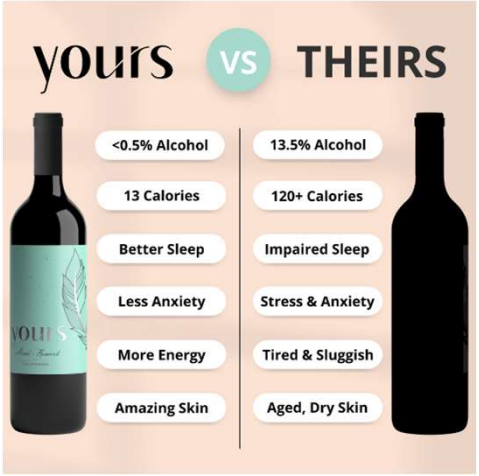
Advance of the date of harvest

However Skins and specially seeds remain already green

Drawbacks of high ethanol content

- Difficulties in alcoholic and/or malolactic fermentation
- Wines with higher volatile acidities
- Some wine aroma and flavour attributes are masked by the excess of alcohol
- Unbalanced wines, especially when serving temperature is high
- Some countries apply higher taxes when the wines have a high alcohol level
- The presence of a high alcohol content on the label often discourages some potential consumers who prefer drinking light and responsibly
- The application of techniques to reduce ethanol content are time-consuming, costly and may affect the quality of the wine

Furthermore, the demand for low-alcohol or even non-alcoholic wines is continuously growing on the market.

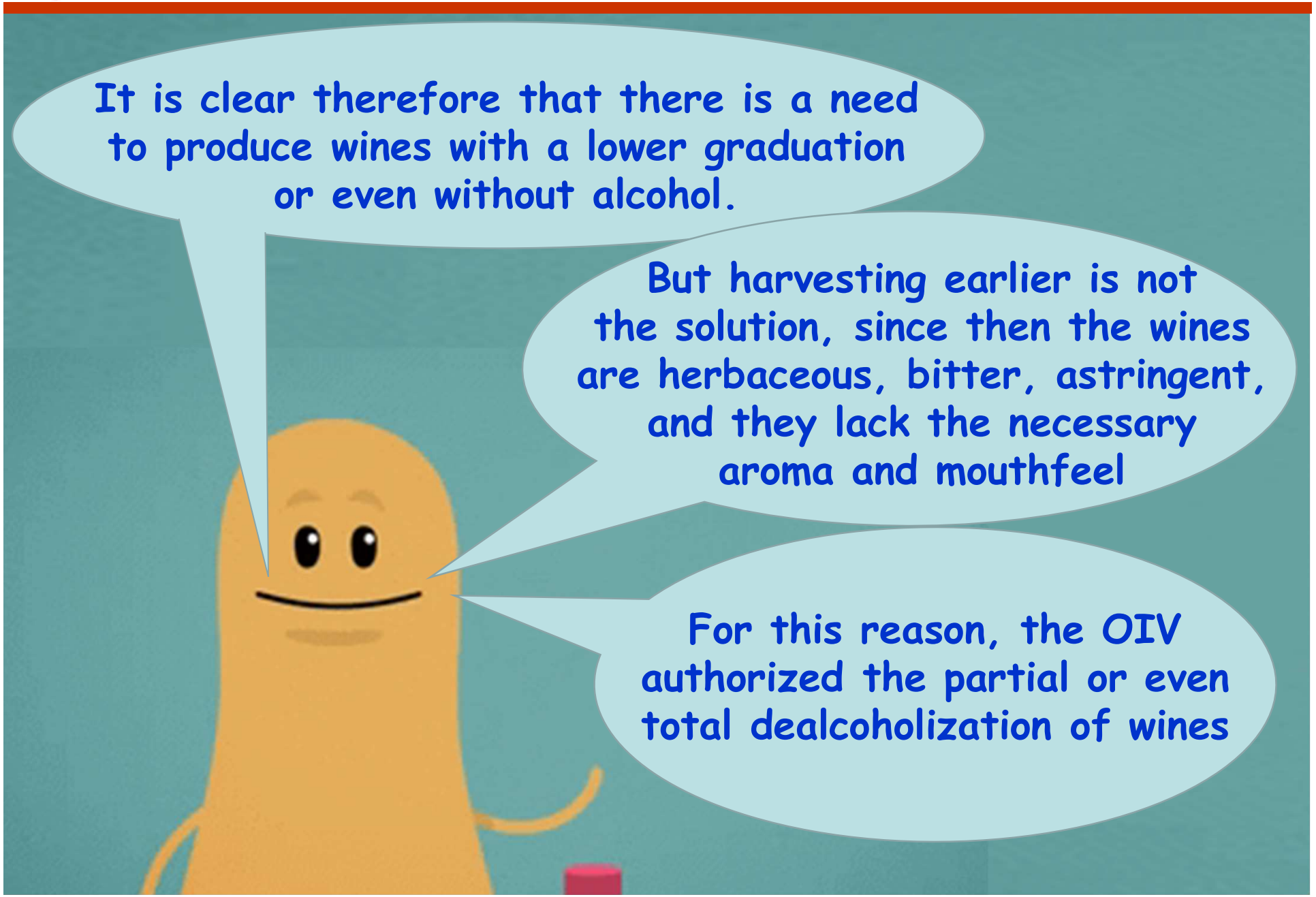


Saliba AJ, Ovington LA, Moran CC (2013) Consumer demand for low-alcohol wine in an Australian sample. Int J Wine Res 5: 1–8

Stasi A, Bimbo F, Viscecchia R, Seccia A (2014) Italian consumers' preferences regarding dealcoholized wine, information and price. Wine Econ Pol 3: 54–61

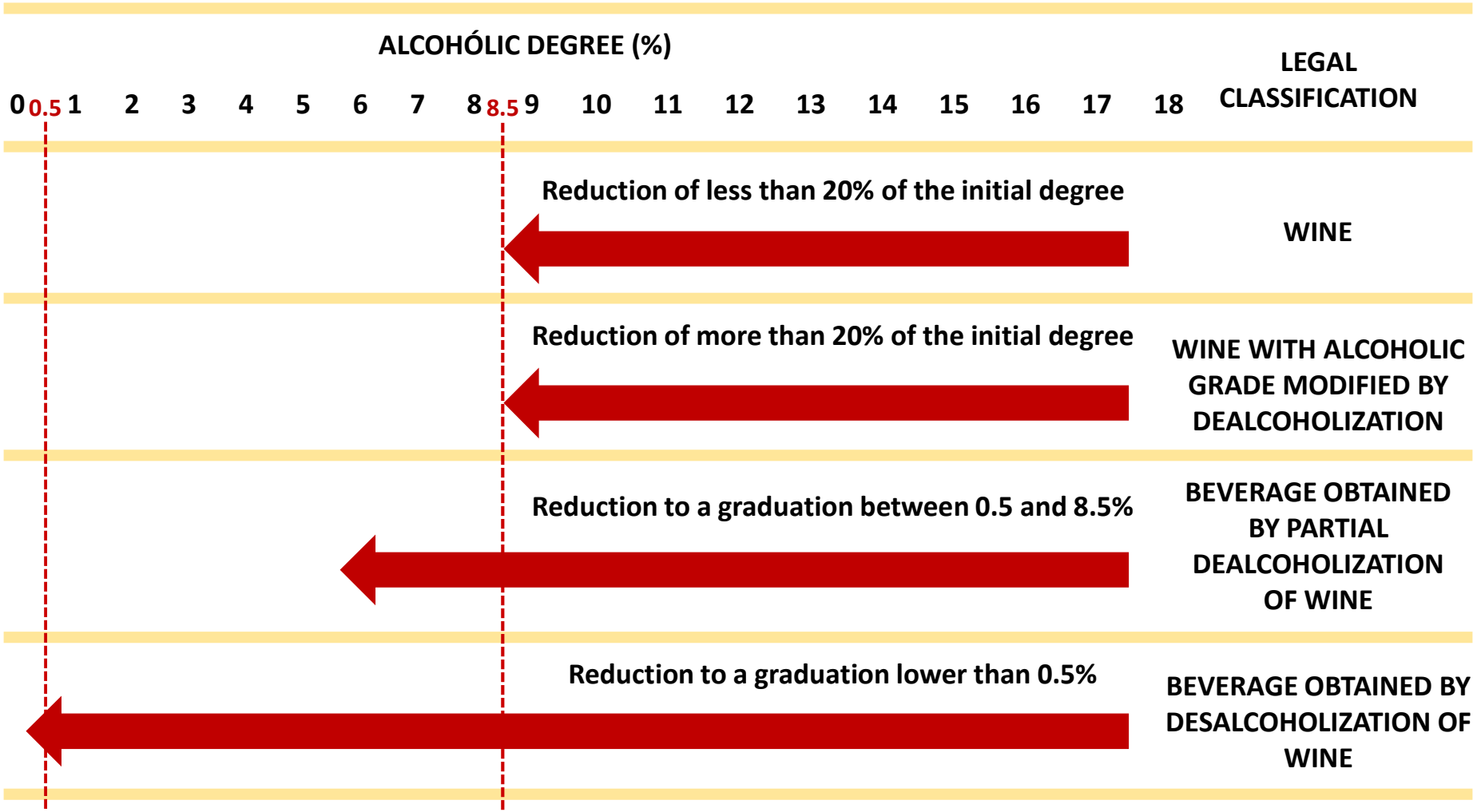
Wilkinson K, Jiranek V (2013) Wine of reduced alcohol content: Consumer and society demand vs industry willingness and ability to deliver. In: Teissedre PL (ed) Alcohol Reduction in Wine; Oneoviti International Network. Vigne et Vin Publications Internationales. Merignac, p 98–104

Dealcoholized wines; dealcoholized wines; procedures and legal aspects



LEGAL CLASSIFICATION OF WINES BASED ON THEIR DEALCOHOLIZATION (OIV)

Resolutions OIV-ECO 432-2012 and OIV-ECO 433-2012



Ruff JC (2013) OIV rules and implications concerning reduction of alcohol levels. In: Teissedre PL (ed) Alcohol Reduction in Wine; Oneoviti International Network. Vigne et Vin Publications Internationales. Merignac, p 49–52

SPECIFIC OENOLOGICAL PRACTICES FOR BEVERAGES OBTAINED BY DEALCOHOLISATION OF WINE (OIV)

Resolution OENO-TECHNO 14-540; STEP 5

- **All oenological practices authorized in wines**

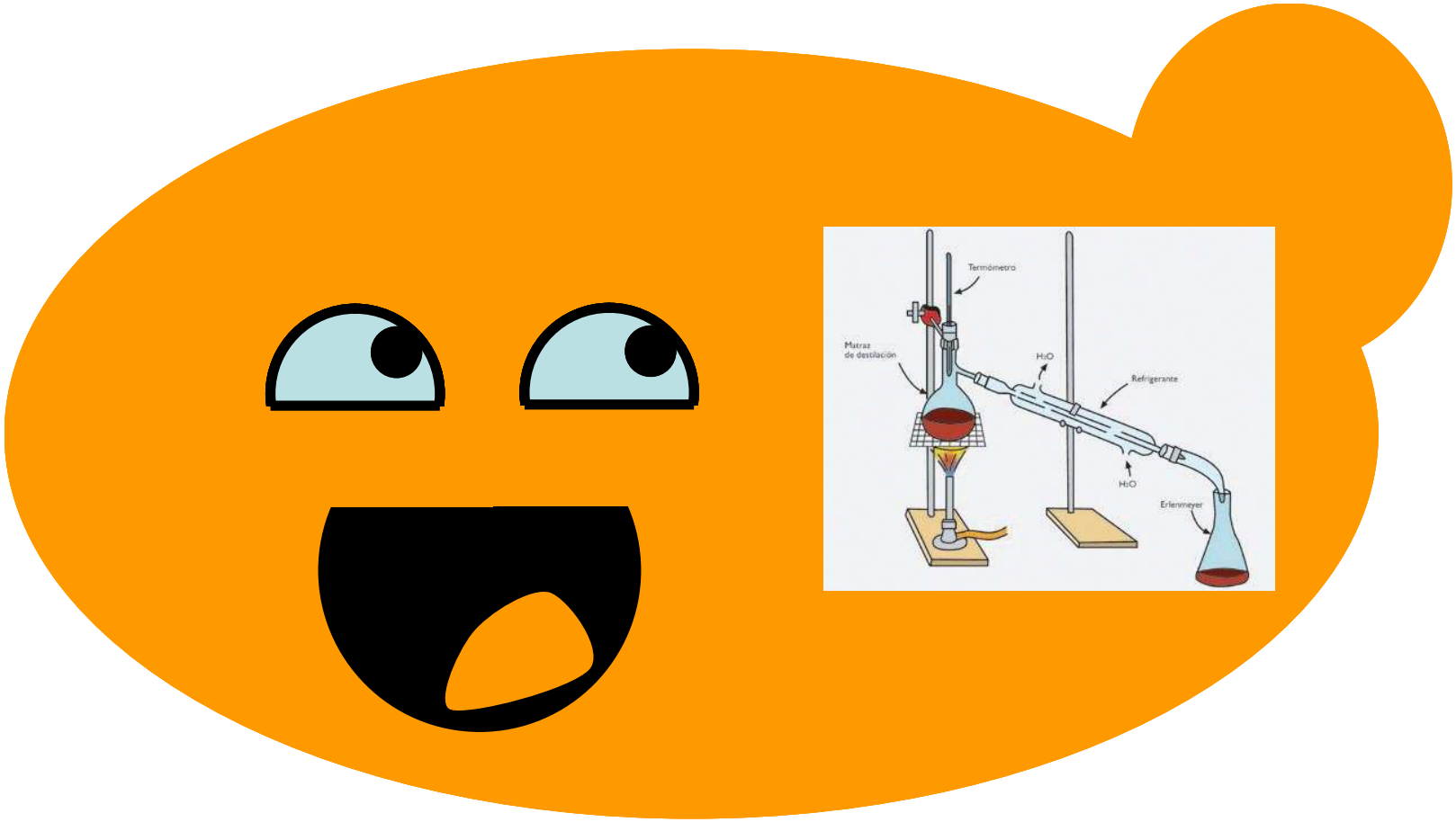
But other ones are now object of discussion in the OIV

Aroma recovery	**Only to reincorporate the own volatile substances evaporated during the desalcoholization process**
Sweetening	**To avoid the sensory consequences of the lack of ethanol** **Only with sugar from grape origin**
Water recovery	**Only to recuperate the losses of water originated in the desalcoholization process. Exogenous or endogenous water ?**

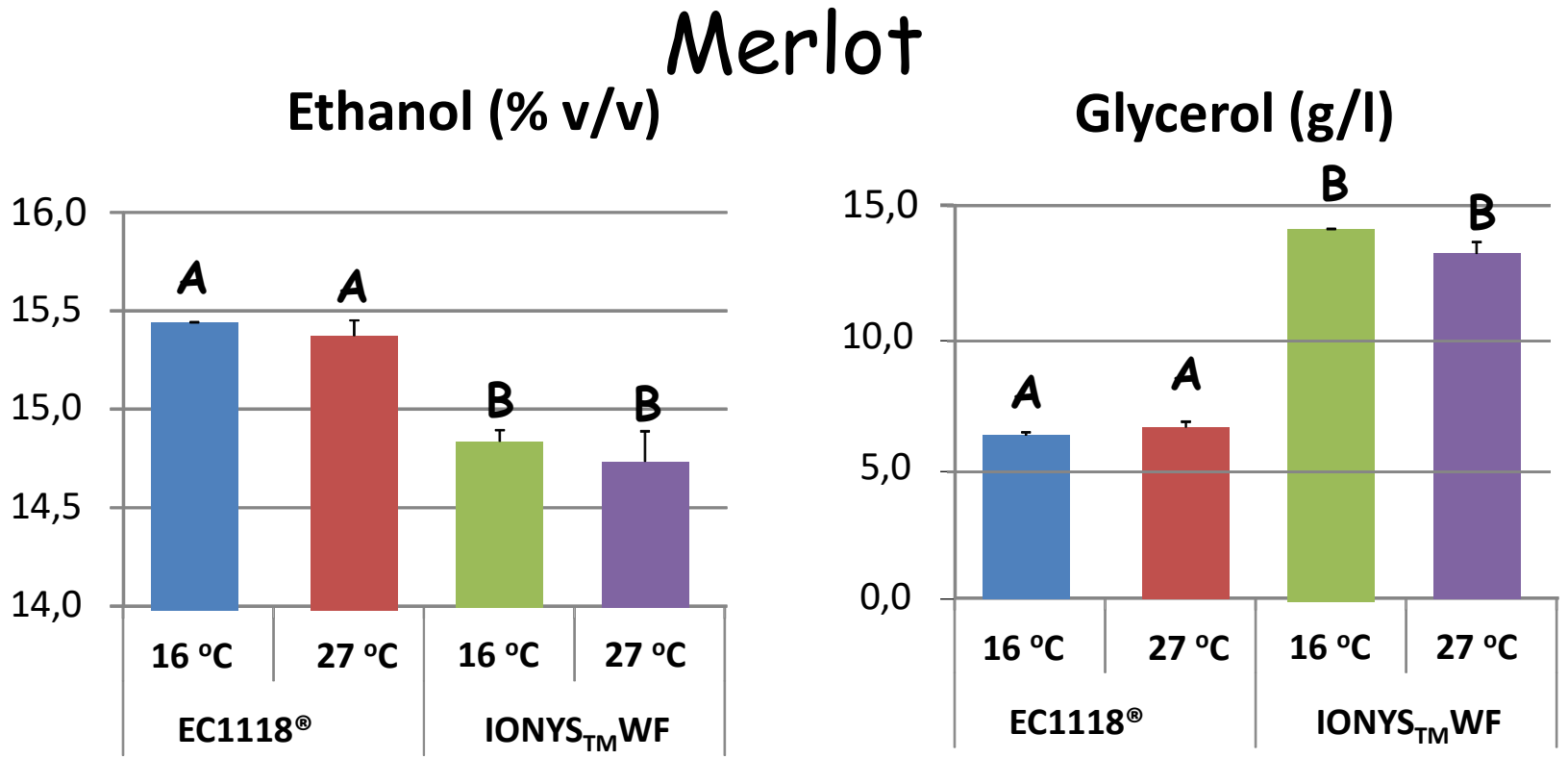
Possible strategies to reduce alcohol content and pH

- Move the vineyards to higher altitudes
- Selection of varieties and clones that mature later
- Adaptation of cultivation techniques to the new situation
- Selection of yeasts with lower sugar/ethanol conversion yield
- Reduction of the concentration of sugars in the must or of ethanol in the wine: reverse osmosis
- Partial or total dealcoholization of wine by vacuum evaporation: the Spinning Cone Column: Golo technology…

USE OF SELECTED YEASTS TO REDUCE THE ALCOHOLIC CONTENT AND/OR pH IN WINES



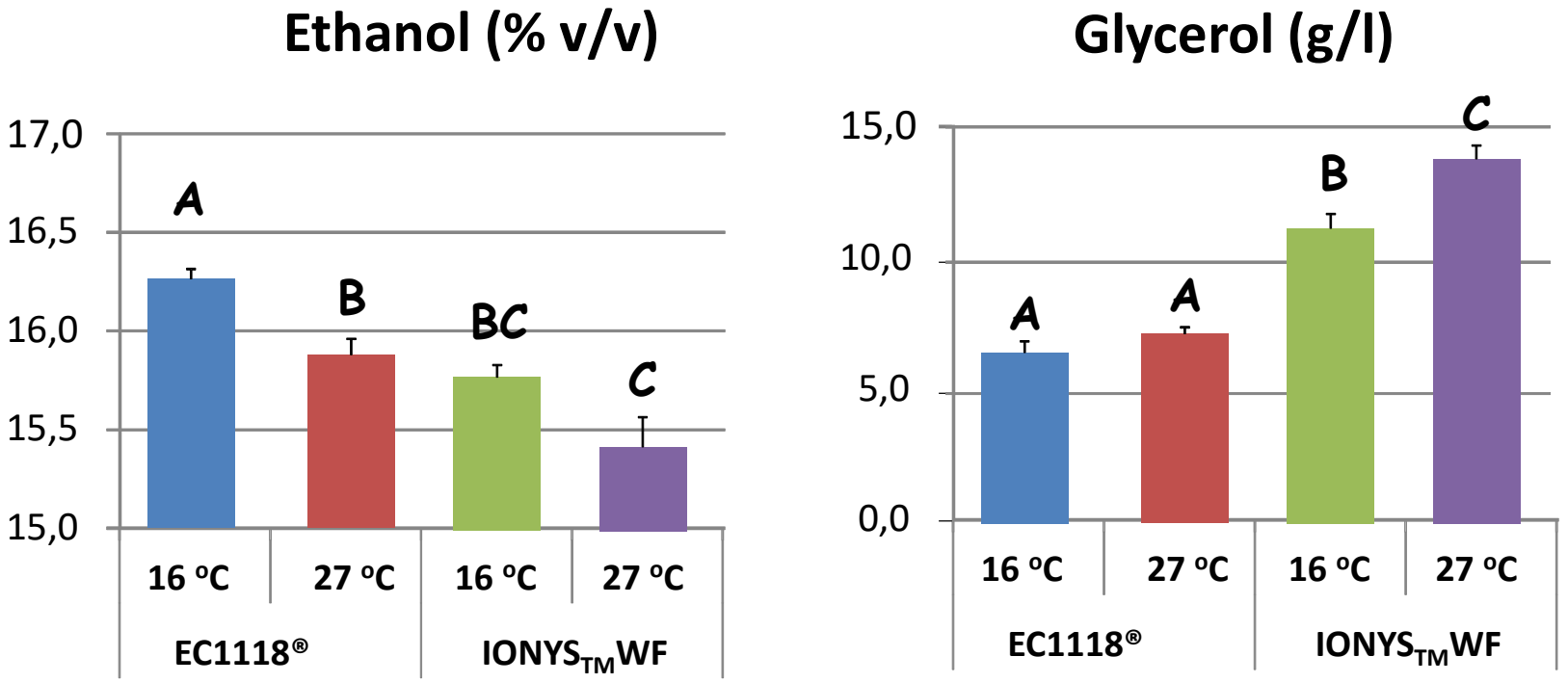
USE OF A SELECTED YEAST THROUGH ADAPTIVE EVOLUTION STRATEGIES TO REDUCE THE ALCOHOLIC GRADE IN RED WINES



Pascual, O., Pons-Mercadé, P., Gombau, J., Ortiz-Julien, A., Heras, J.M., Fort, F., Canals, J.M., Zamora, F. (2017). Study of the effectiveness of a strain of Saccharomyces cerevisiae selected for the production of wines with higher acidity and lower alcoholic strength. BIO Web of Conferences 9, 02002 (2017). DOI: 10.1051/bioconf/20170902002

USE OF A SELECTED YEAST THROUGH ADAPTIVE EVOLUTION STRATEGIES TO REDUCE THE ALCOHOLIC GRADE IN RED WINES

Garnacha Tinta



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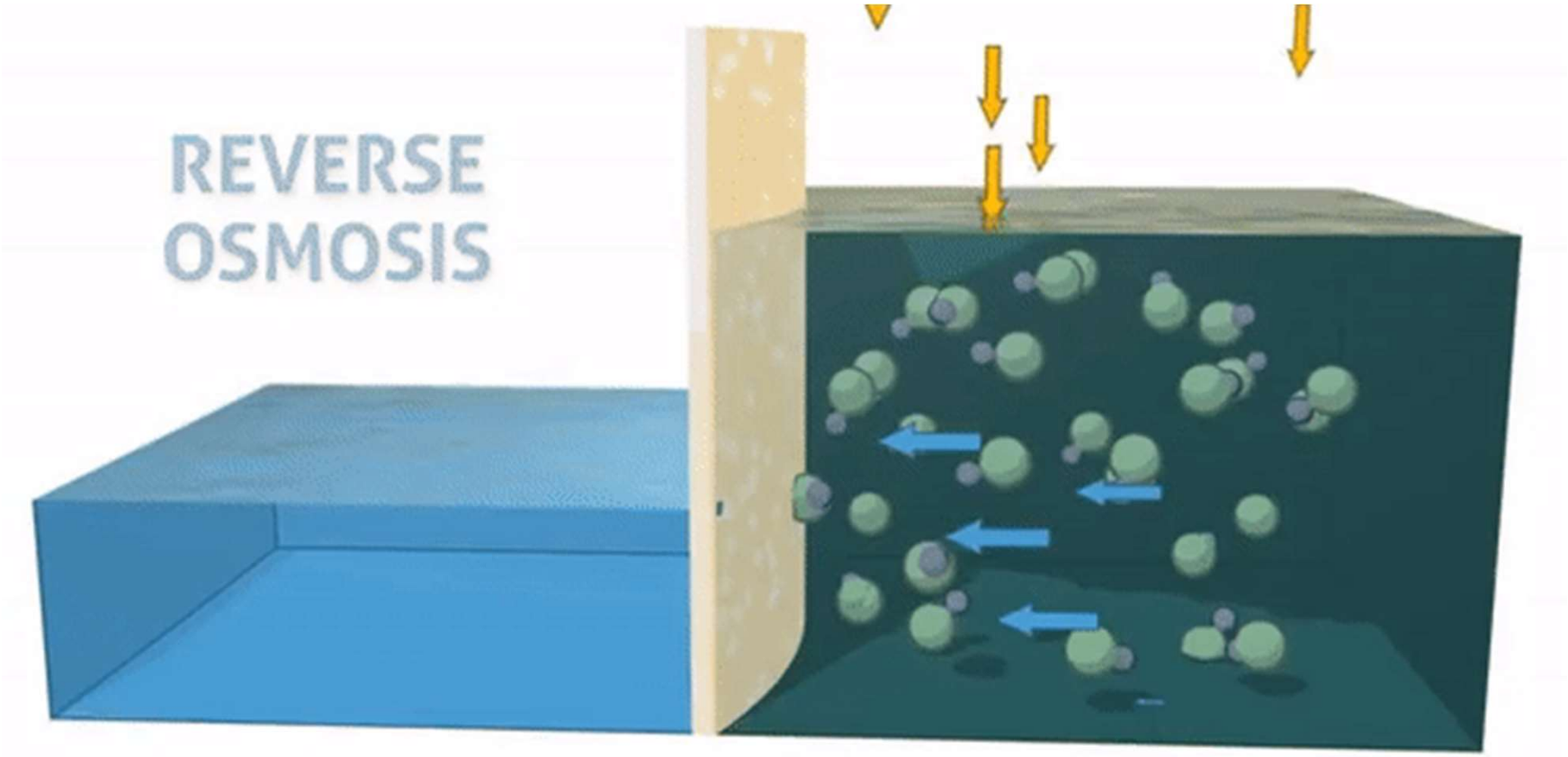
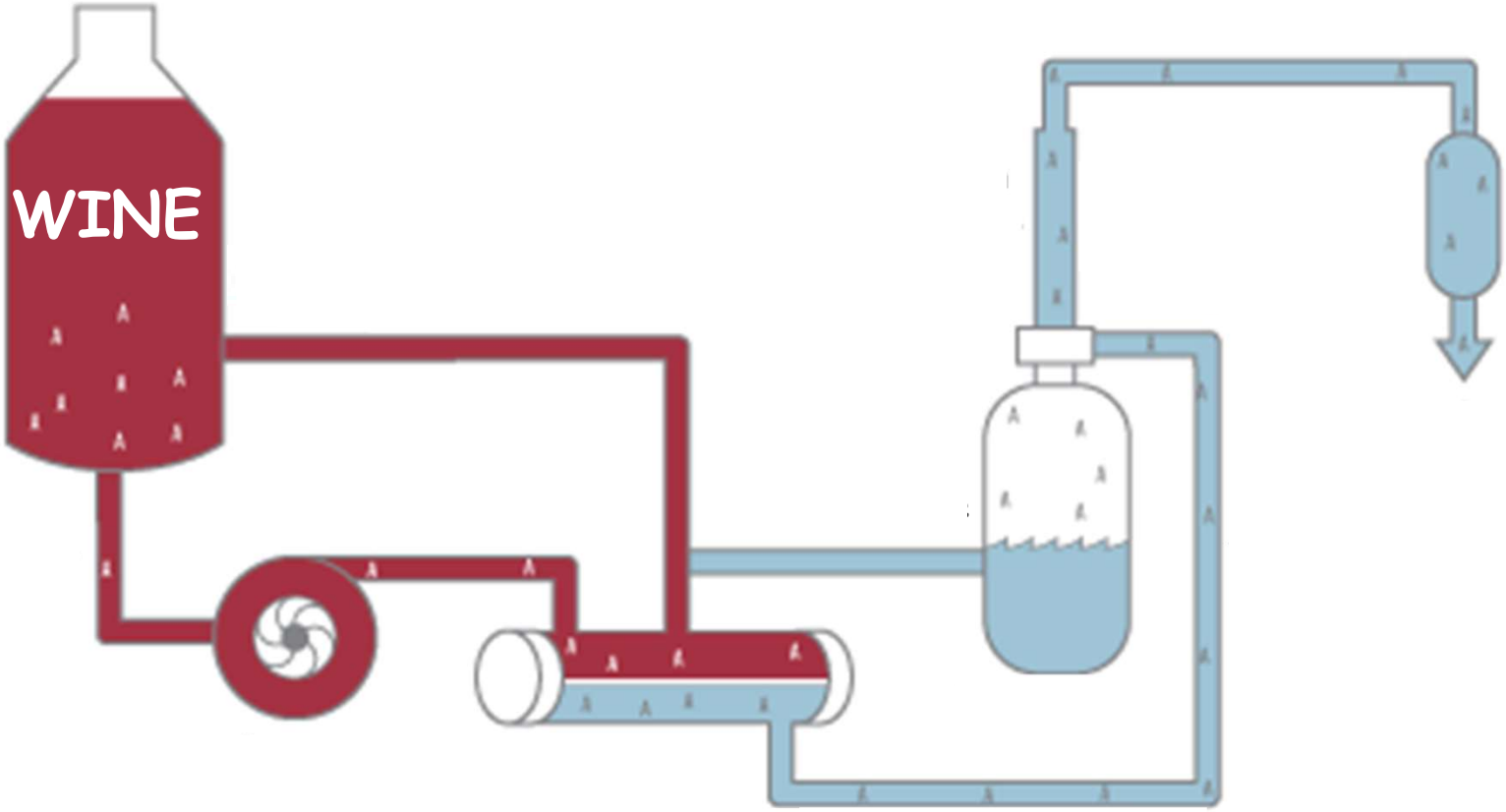
Reverse Osmosis



◊ Treatment in grape juice

◊ Treatment in wine

Partial dealcoholization of wine by reverse osmosis



Partial dealcoholization by reverse osmosis

Gil, M., Estévez, S., Kontoudakis, N., Fort, F., Canals, J.M. Zamora, F. (2013) Eur. Food Res.Tech., **237**, 481–488.

Parameter	DO Penedès			DOQ Priorat		
	Control	-1%	-2%	Control	-1%	-2%
Ethanol content (%)	14.8 ± 0.2 A	13.8 ± 0.2 B	12.8 ± 0.2 C	16.2 ± 0.2 A	15.1 ± 0.2 B	14.1 ± 0.1 C
Titratable acidity (g/l)	4.8 ± 0.1 A	4.8 ± 0.1 A	4.9 ± 0.1 A	5.2 ± 0.1 A	5.2 ± 0.1 A	5.6 ± 0.1 B
Color intensity	15.3 ± 1.5 A	15.6 ± 0.9 A	15.4 ± 0.7 A	15.4 ± 0.2 A	15.2 ± 0.4 A	14.5 ± 0.5 A
Hue	67.7 ± 1.1 A	67.9 ± 0.4 A	68.3 ± 1.5 A	59.3 ± 1.2 A	60.0 ± 0.4 A	59.2 ± 0.5 A
Anthocyanins (mg/l)	567 ± 41 A	546 ± 19 A	574 ± 14 A	200 ± 13 A	206 ± 23 A	226 ± 11 A
IPT	72.9 ± 2.5 A	73.9 ± 2.3 A	75.8 ± 20.6 A	62.4 ± 0.5 A	62.2 ± 0.2 A	62.1 ± 0.8 A
Proanthocyanidins (g/l)	1.8 ± 0.3 A	1.6 ± 0.2 A	1.7 ± 0.2 A	1.6 ± 0.2 A	1.7 ± 0.3 A	1.5 ± 0.2 A
mDP	6.8 ± 1.2 A	7.5 ± 1.8 A	7.2 ± 0.6 A	6.8 ± 1.8 A	5.8 ± 0.3 A	6.5 ± 0.7 A

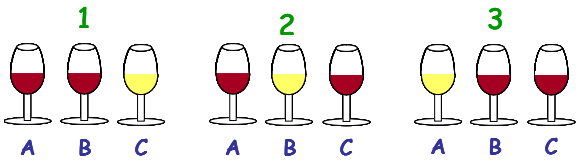
Only significant differences in alcoholic strength

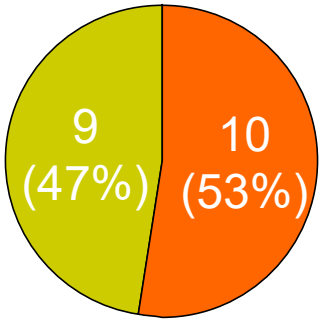
Partial dealcoholization by reverse osmosis

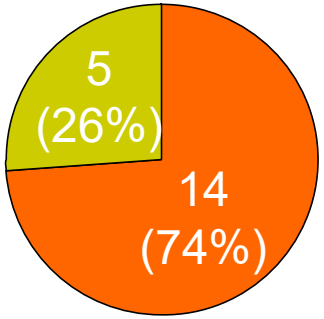
Gil, M., Estévez, S., Kontoudakis, N., Fort, F., Canals, J.M. Zamora, F. (2013) Eur. Food Res.Tech., **237**, 481–488.

AOC Priorat; Garnacha/Mazuelo (16,3 % etanol)

Sensory Analysis – Triangular test -







Control vs - 1,3%

$p < 0.05$

Preference

Control	6
- 1,3 %	4

Control vs- 2,6%

$p < 0.001$

Preference

Control	8
- 2,6 %	6

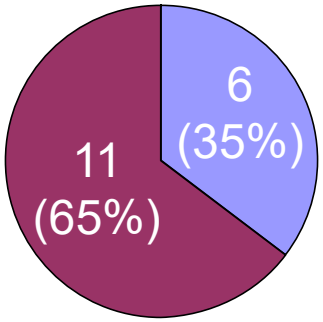
Partial dealcoholization by reverse osmosis

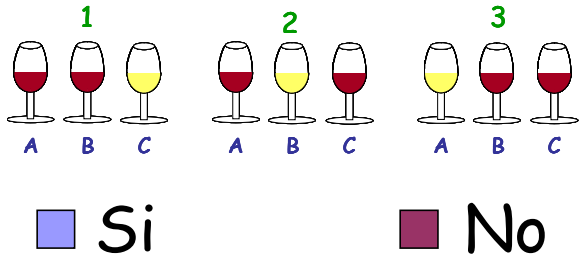
Gil, M., Estévez, S., Kontoudakis, N., Fort, F., Canals, J.M. Zamora, F. (2013) Eur. Food Res.Tech., **237**, 481–488.

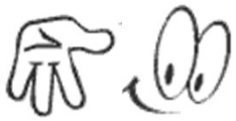
AOC Penedès; Cabernet Sauvignon (14,8 % etanol)

Sensory Analysis – Triangular test -

Control vs- 1,0%





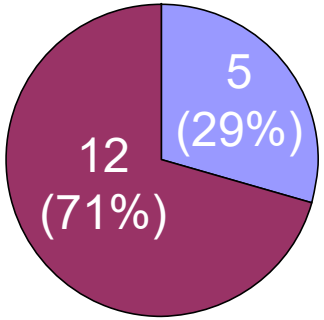


p > 0.05

Preference

Control	4
- 1,0 %	2

Control vs - 2,0%

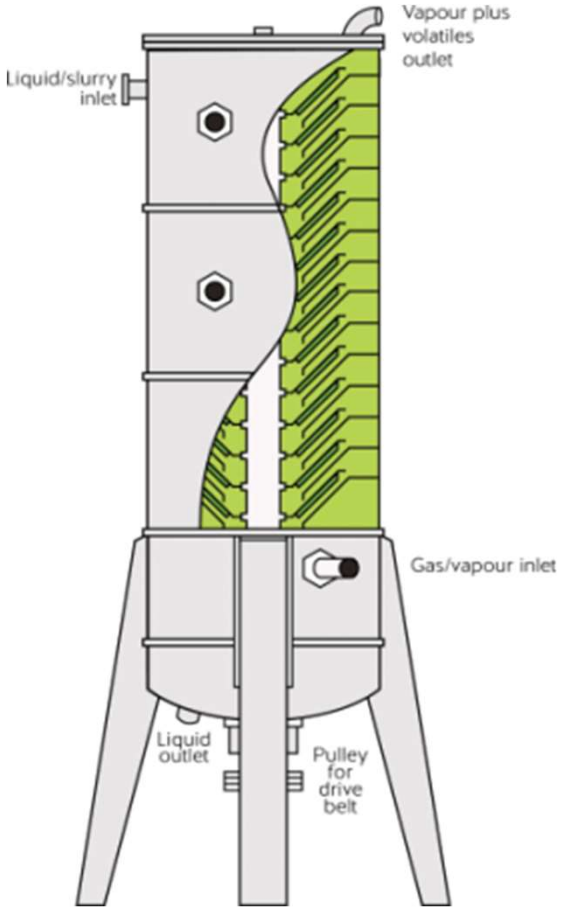


p > 0.05

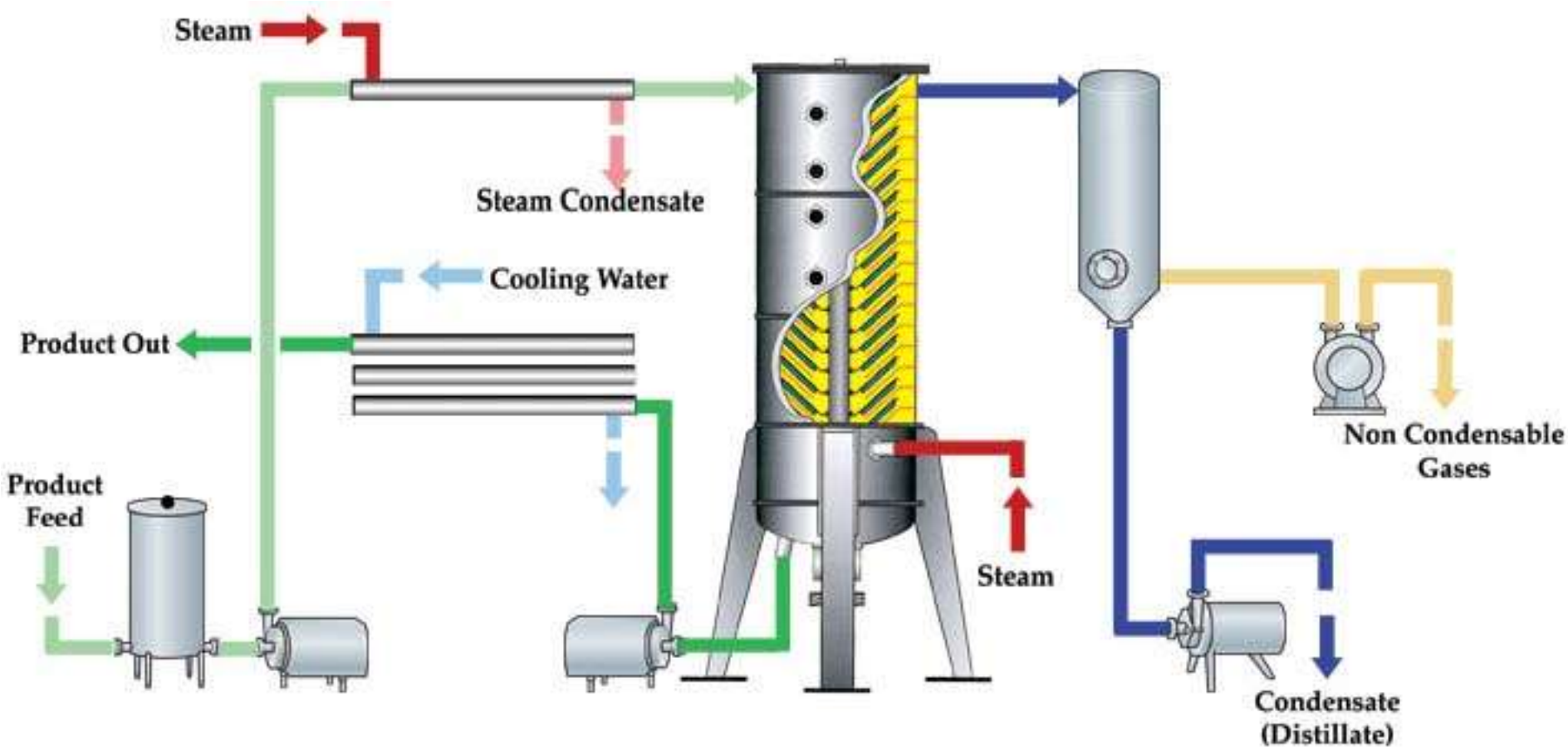
Preference

Control	5
- 2,0 %	0

THE SPINNING CONE COLUMN



Partial dealcoholization of wine by evaporation; The Spining Cone Column)



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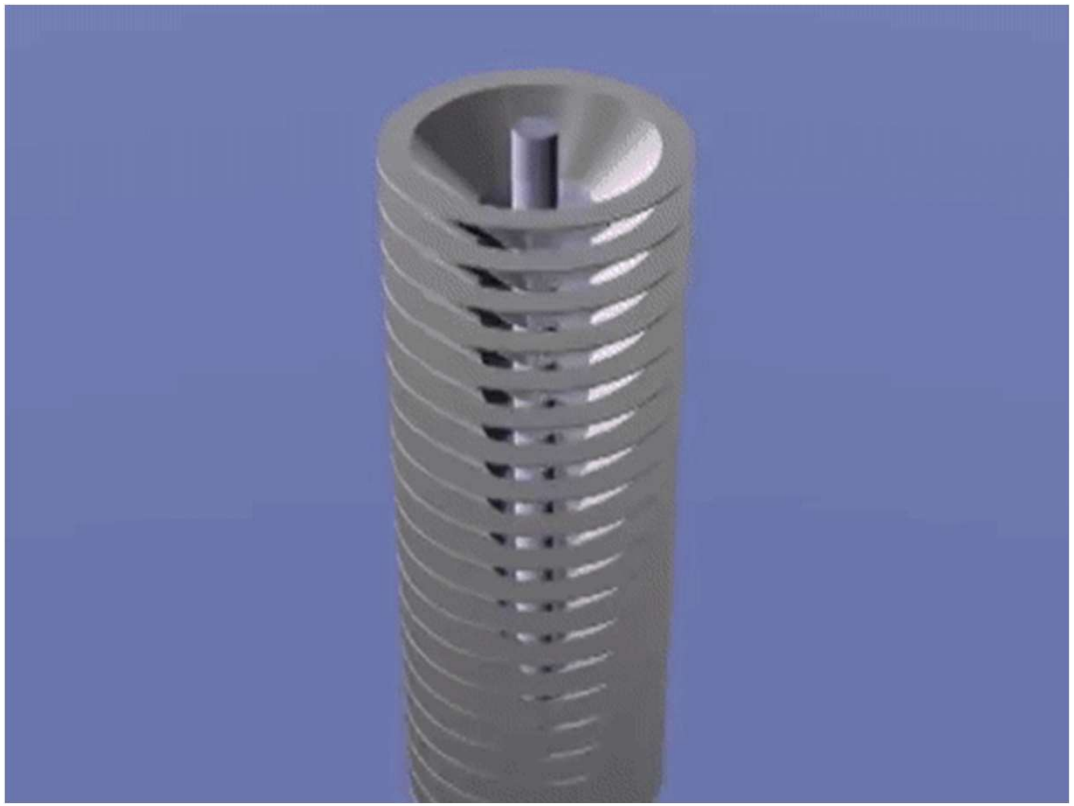
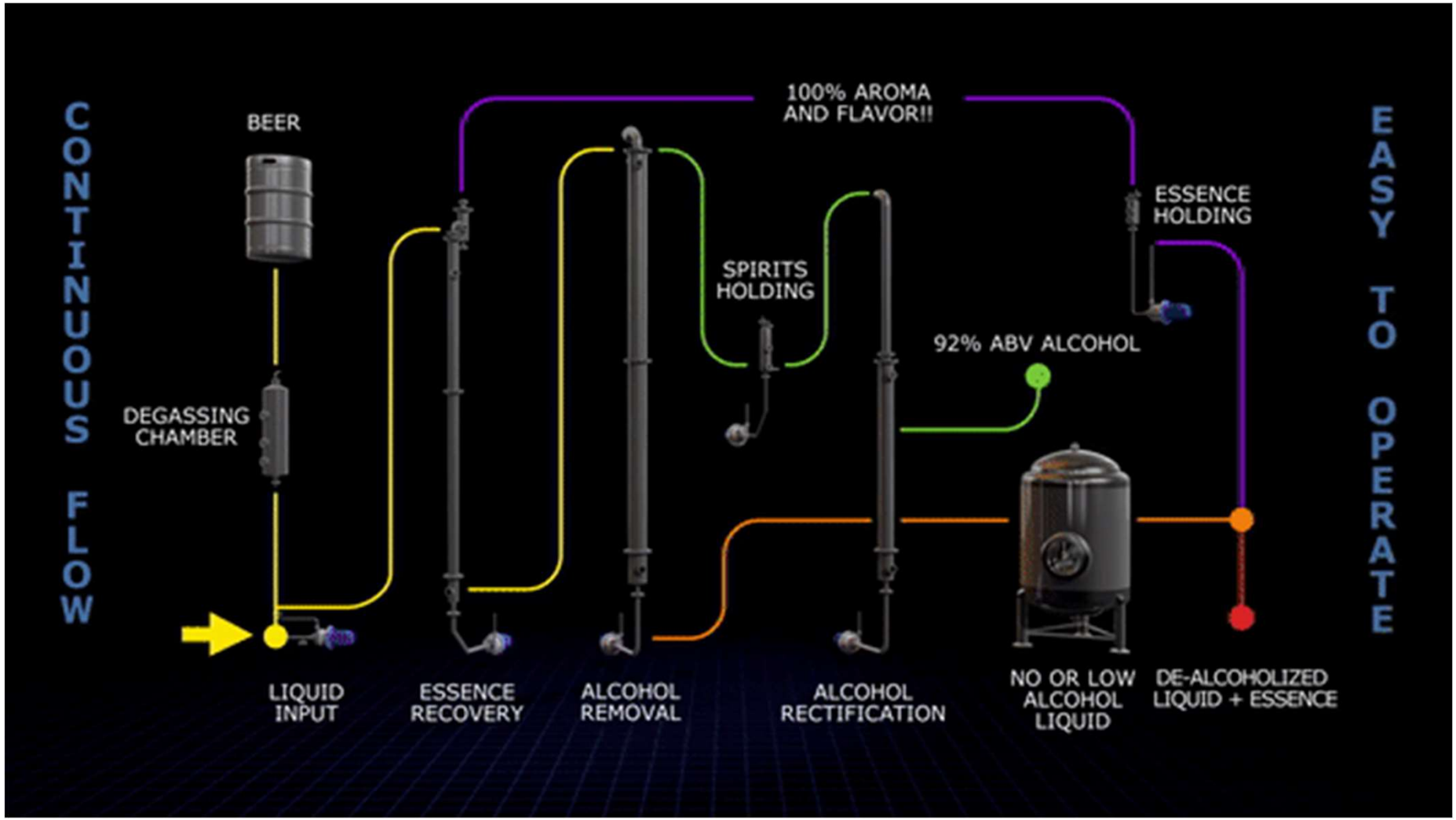


The GOLO technology



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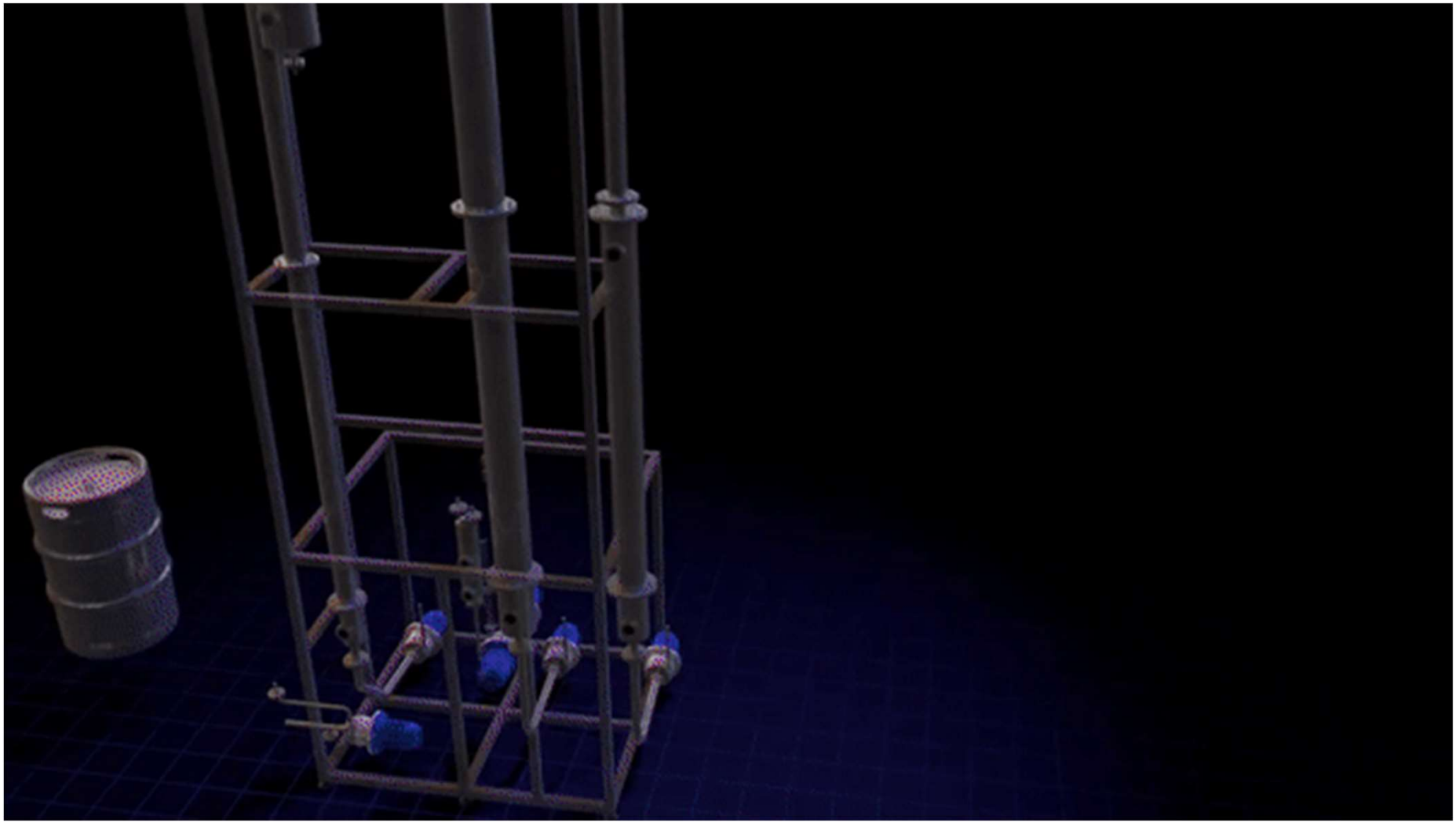

Comparison: SCC vs GoLo Technology

	SCC	GoLo
Number of passes	2	1
Time of the process	Slower Processing (Twice)	Faster Processing
Moving parts	Multiple (20 +)	NO
Maintenance	High	Low
Rectification	NO	Up to 85% ABV
Investment	HIGH	LOW (40% less)
Model	No Customization	Customization
Yield Loss	Higher 22-32%	Lower 12-18%

BevZero Equipment

The only true solution