

The Easy-To-Use « E2U™ » yeast technology revolution: direct inoculation demystified

OREGON WINE SYMPOSIUM WEBINAR, FEBRUARY 2022



THE OBVIOUS CHOICE FOR BEVERAGE FERMENTATION

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SUMMARY

1. The E2U™ Active Dry Yeast Concept
2. Our E2U™ ADY Production Process
3. Our E2U™ ADY Validation Process
4. Practically & Our Range of E2U™ of Active Dry Yeast

1.

THE E2U™ ACTIVE DRY YEAST CONCEPT

E2U™ CONCEPT

GLOBAL CONCEPT

Yeasts and Yeast derivatives facilitating wine making!



Global concept of winemaking simplification through the use of easy-to-use and efficient products in order to:

- **Optimize wineries' processes, productivity and working costs,**
- **Avoid** eventual multiple **extra costs** due to **wine elaboration process failure** (fermentation, characterization and stabilization) and
- Make **working conditions safer and more sustainable.**

EASY-2-USE SPECIFICITY

- Specific yeast production and drying process allowing making **yeast resistant to very diverse usage conditions** including

- Rehydration in pure room temperature water and
- Direct inoculation into the must

while preserving their fermentative efficiency and their aromatic characteristics.



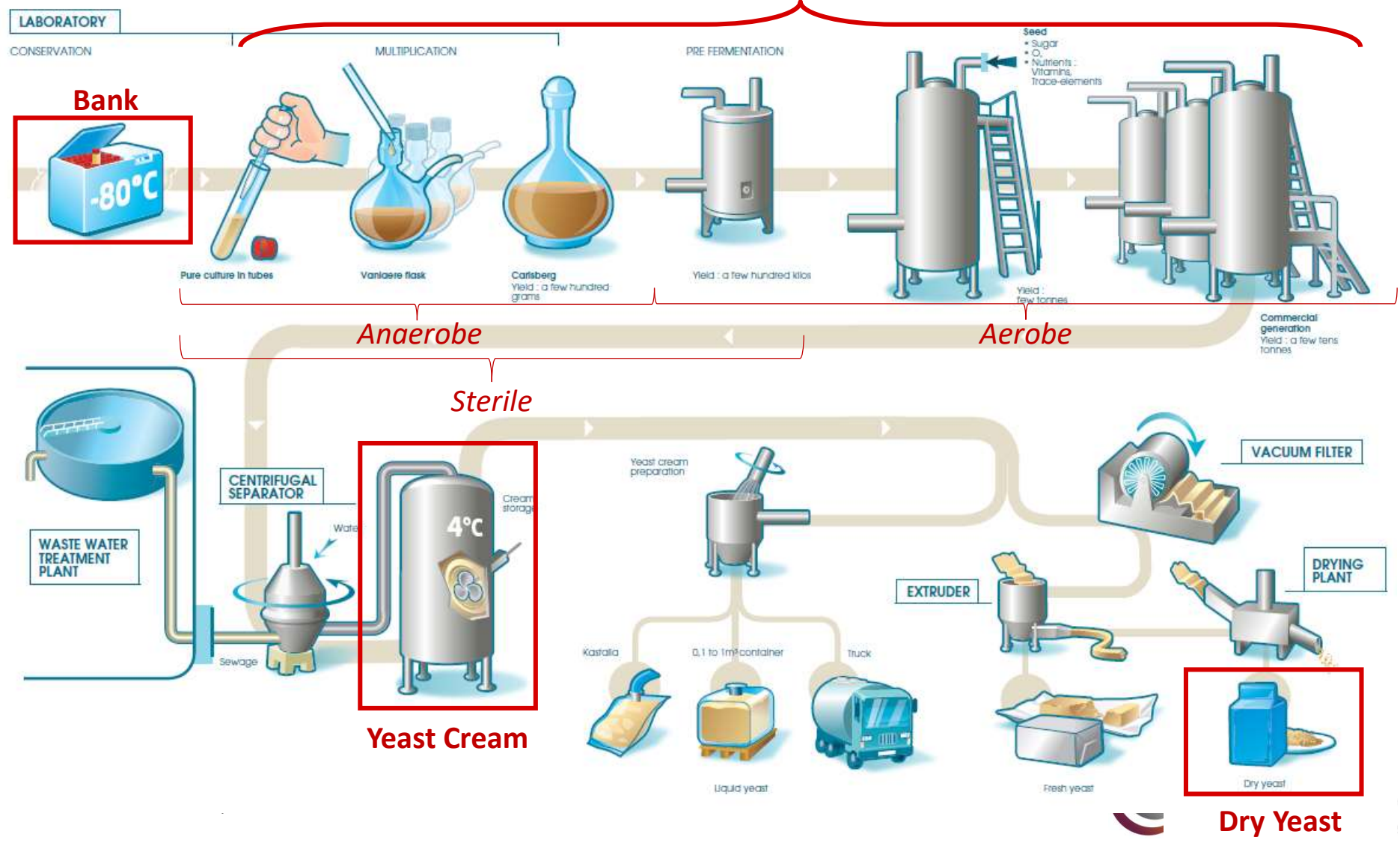
2.

OUR E2U™ ADY PRODUCTION PROCESS

E2U™ PRODUCTION SPECIFICITY

PRODUCTION

Multi-stage process



PRODUCTION - ESSENTIALS

- Pure culture
 - On complete medium (C/N/P/Min/Vit/Trace Elts)

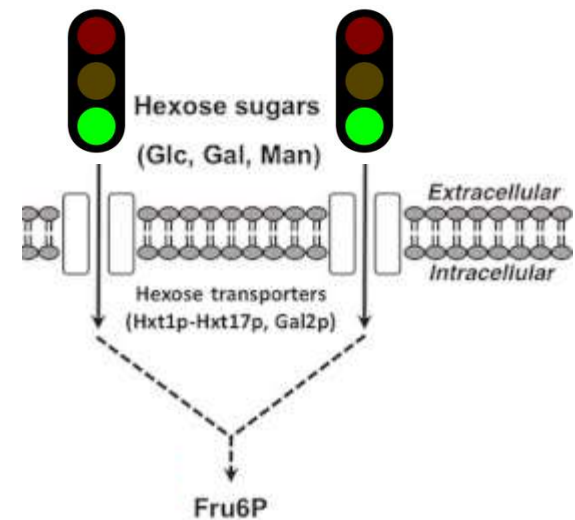
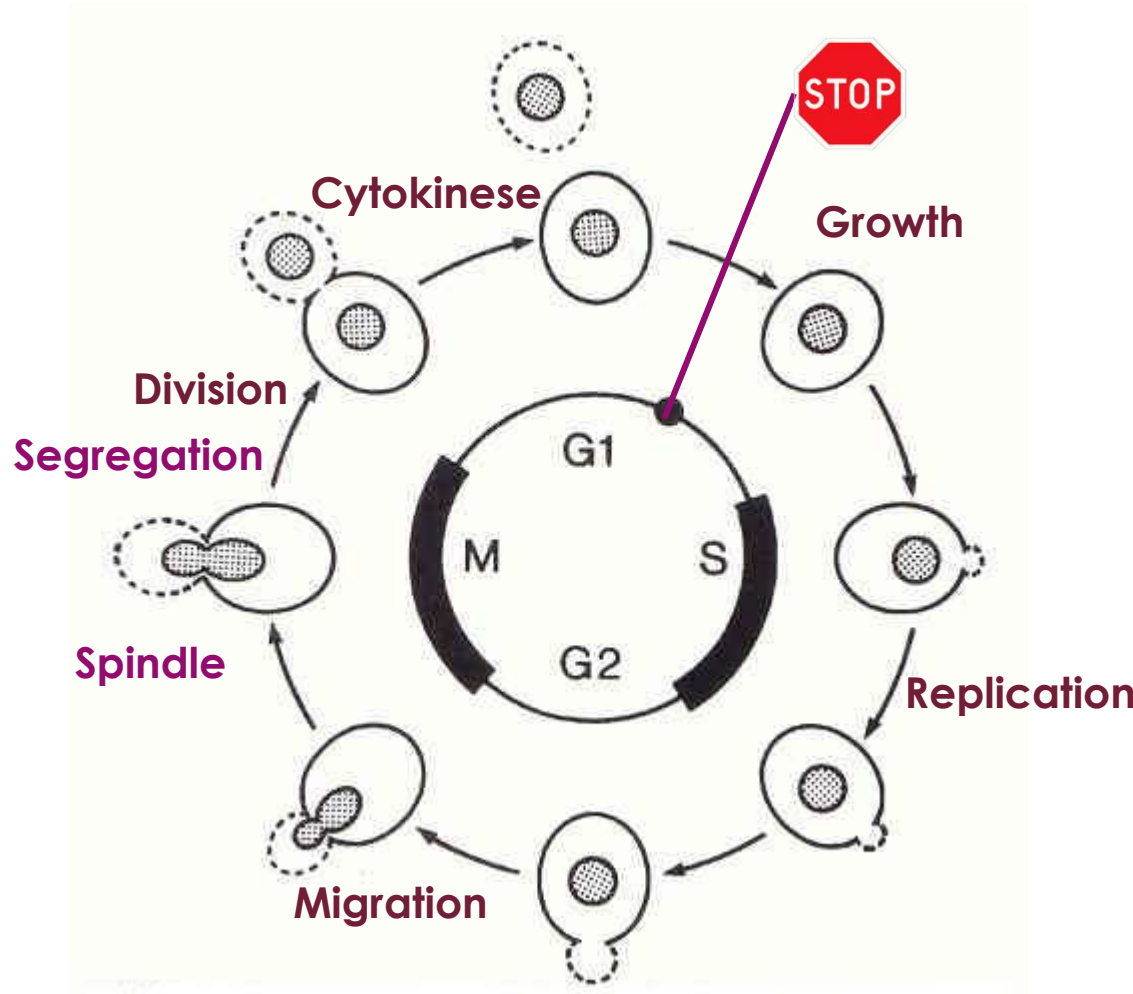
- Maintaining a maximum yeast growth rate monitoring:
 - Alcohol
 - pH
 - Temperature
 - Nitrogen

- 1 production recipe per strain!
 - Genetic stability tests
 - Growth capabilities tests
 - Industrial drying capabilities

PRODUCTION – KNOW-HOW

➤ Multiplication

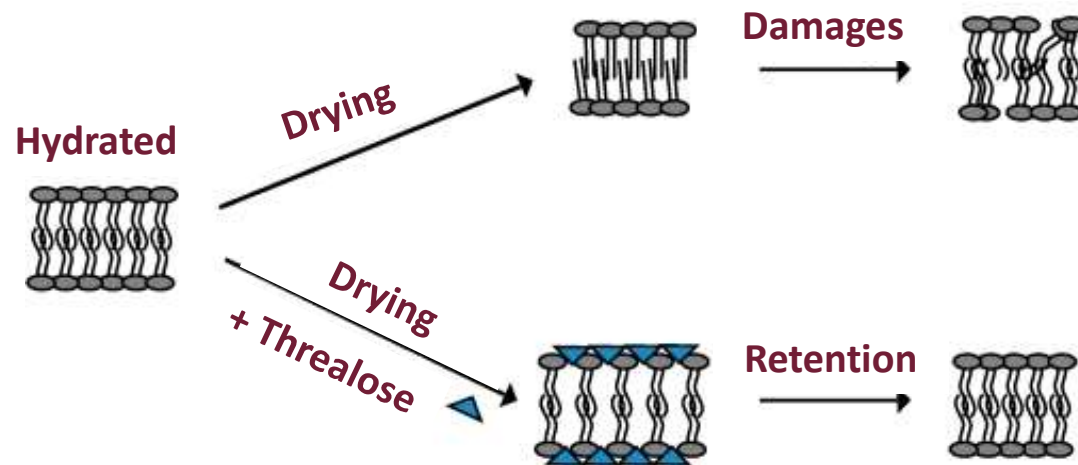
- Fix the yeast in its best physiological state for a **direct fermentation of the present sugars** (doors open!)



DY PRODUCTION – KNOW-HOW

➤ Drying

- Condition the yeast to resist to drying and future rehydration
 - Lipids and threalose content

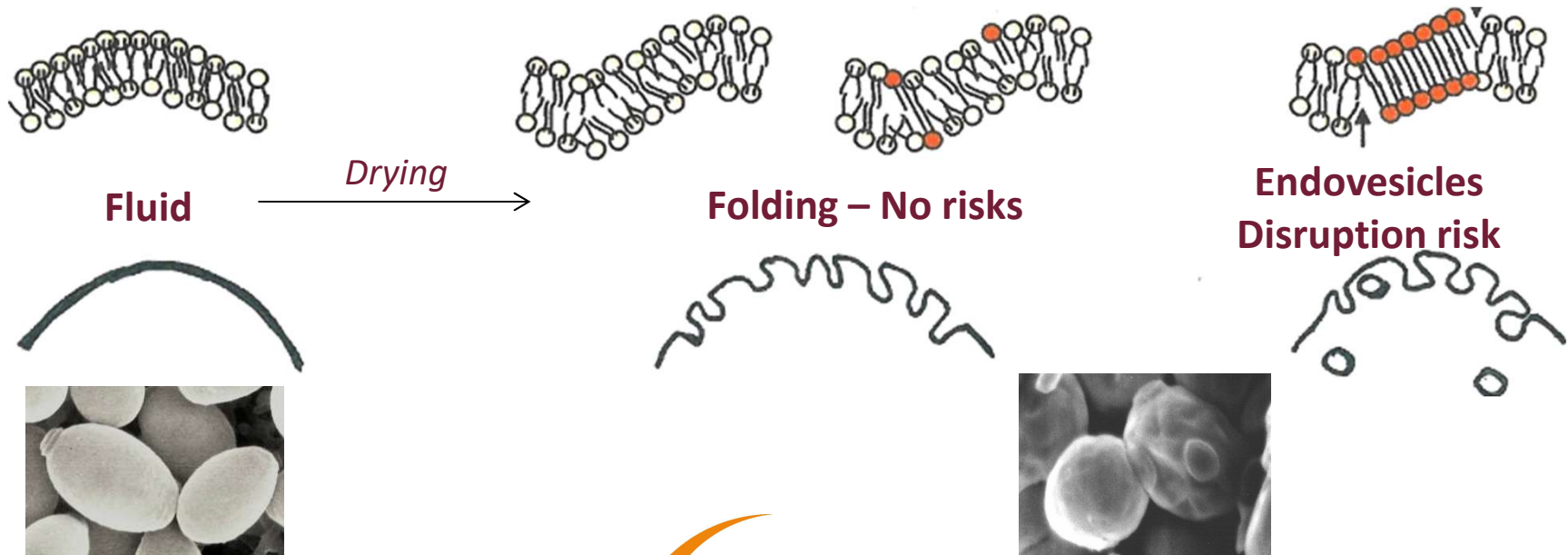


- Emulsifier addition

DY PRODUCTION – KNOW-HOW

➤ Drying

- Adopt the most gentle drying – fluidilized bed



➔ Process E2U™



DY PRODUCTION – KNOW-HOW

- Packaging
 - Under-vacuum packed
 - Preserve yeast from oxygen and humidity

- Quality control
 - Every batches released based on strict and specific quality tests
 - Purity, composition, physiology, properties...

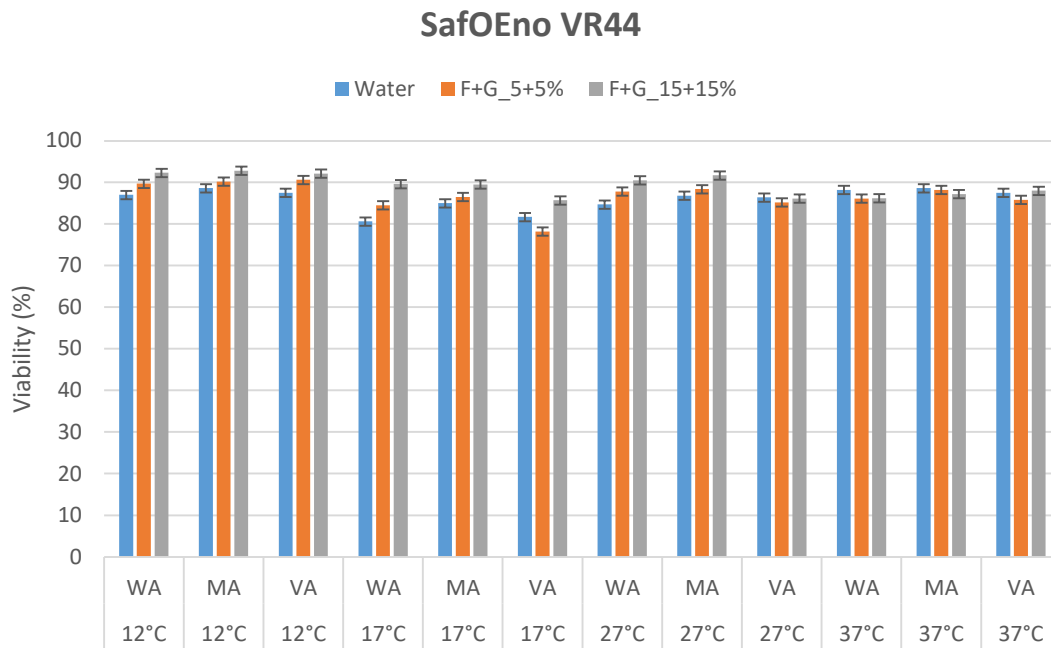
- Guarantee
 - 4 years shelf life
 - Forced ageing tests

2.

OUR E2U™ ADY VALIDATION PROCESS

3 STEPS – LAB SCALE

1. Viability after rehydration: Impact of temperature, medium and stirring conditions



	Viability (%)	Viable cell. (10 ⁹ cell./ml)	log (viable cells)
Min	78,20	0,60	9,84
Max	92,80	1,37	10,19
Difference	14,60	0,76	0,36

Significant differences (slightly below at 17°C)... BUT

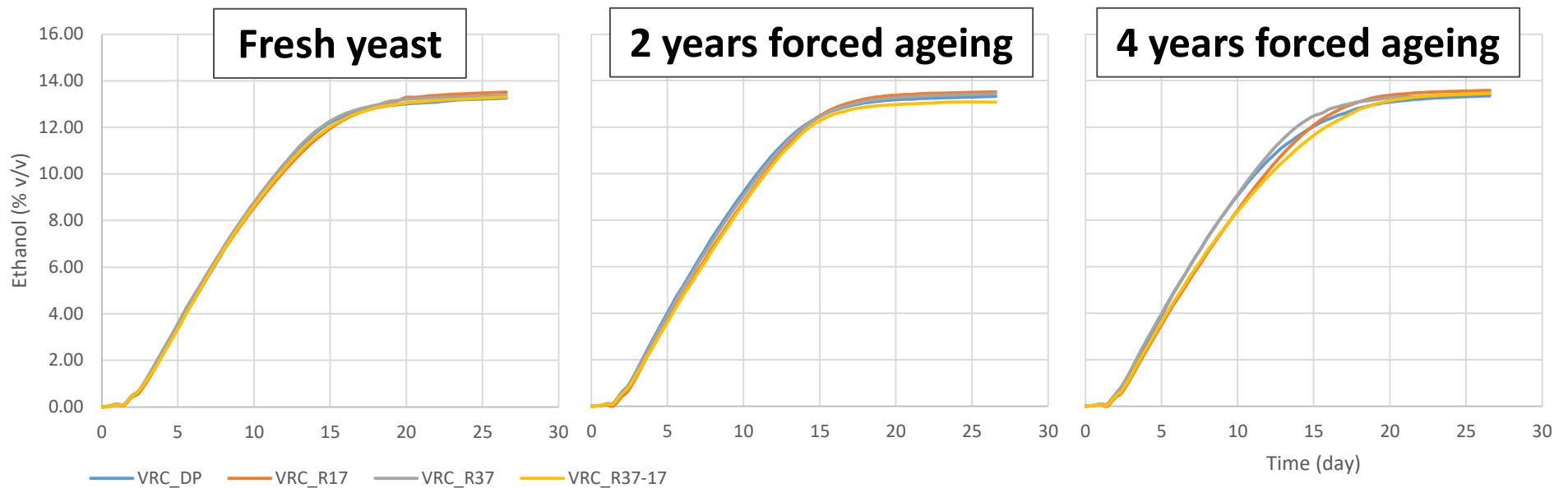
High remaining viabilities and very small differences in viable cells showing a very high robustness

Suspension of ADY at 10% w/w
 Media → F+G: Fructose+Glucose
 Agitation (A) → W: without, M: moderate, V: violent

Trypan blue detection

3 STEPS – LAB SCALE

2.a Fermentative performances: Impact of usage conditions on kinetics



Rehydration mode → DP: Direct Pitch, R17: Rehydration in water at 17°C, R37: 37°C, R37-17: Progressive Acclimatization 37°C to 17°C

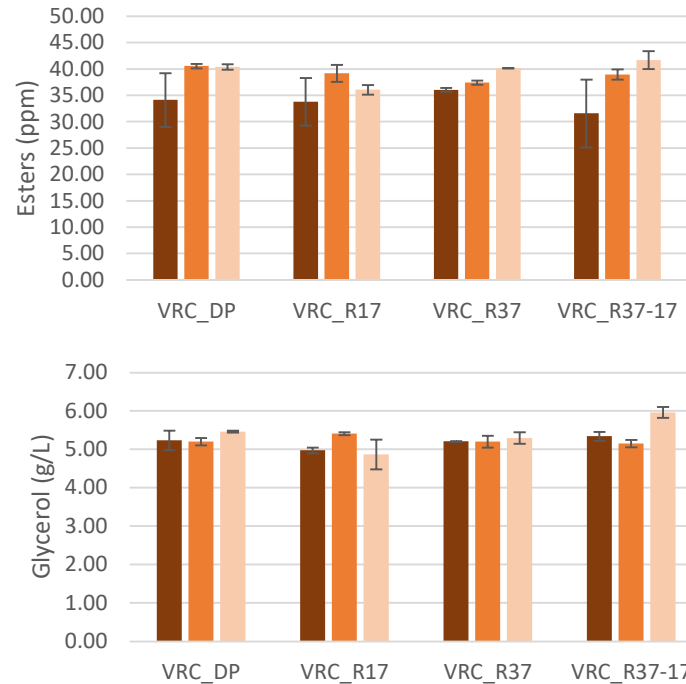
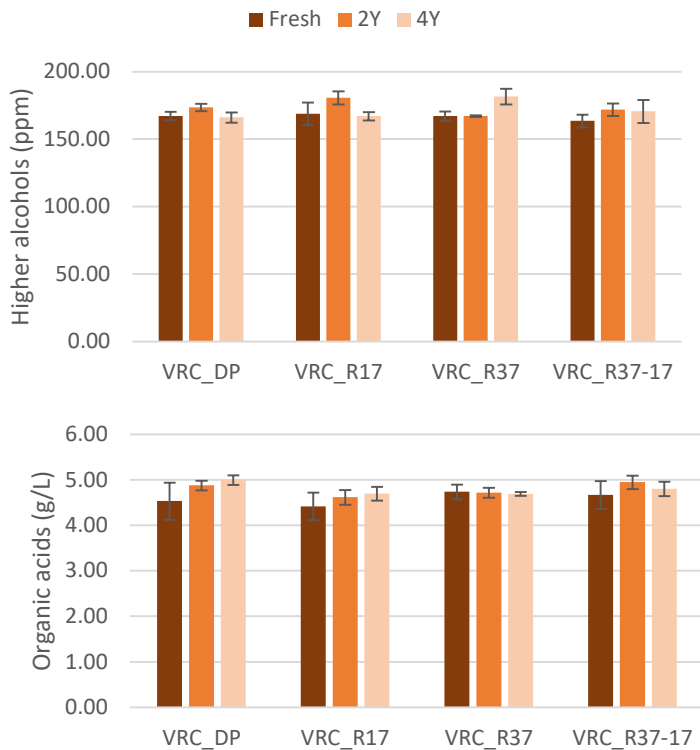
Medium → OIV synthetic medium at 230g/L of sugars adjusted to a ratio YAN/S of 0.8 and 50ppm of SO₂

Fermentation temperature → 15°C

Less than ½ day differences between rehydration modes after 2 years, up to 2 days after 4 years but with **recovery!**

3 STEPS – LAB SCALE

2.a Fermentative performances: Impact of usage conditions on analytical parameters



No relevant differences

Robustness as well on analytical parameters and **stability during ageing**

Forced ageing → 2Y: 2 years, 4Y: 4 years

3 STEPS - MICROVINIFICATION

2.b Fermentative performances: Impact of usage conditions on kinetics and analytical parameters

Trial France 2018		Melon de Bourgogne
Sugars	g/L	189.4
Turbidity	NTU	< 30
Total acidity	g H ₂ SO ₄ /L	3.95
Volatile acidity	g H ₂ SO ₄ /L	< 0.1
pH		3.09
YAN	mg/L	45
Ammoniacal nitrogen	mg/L	38
Alpha amino nitrogen	mg/L	7
L malic acid	g/L	3.4
Tartaric acid	g/L	3.6

Adjustment ratio YAN/S to 0.6 with 50% DAP at yeast inoculation and 50% AS at initial density - 40,

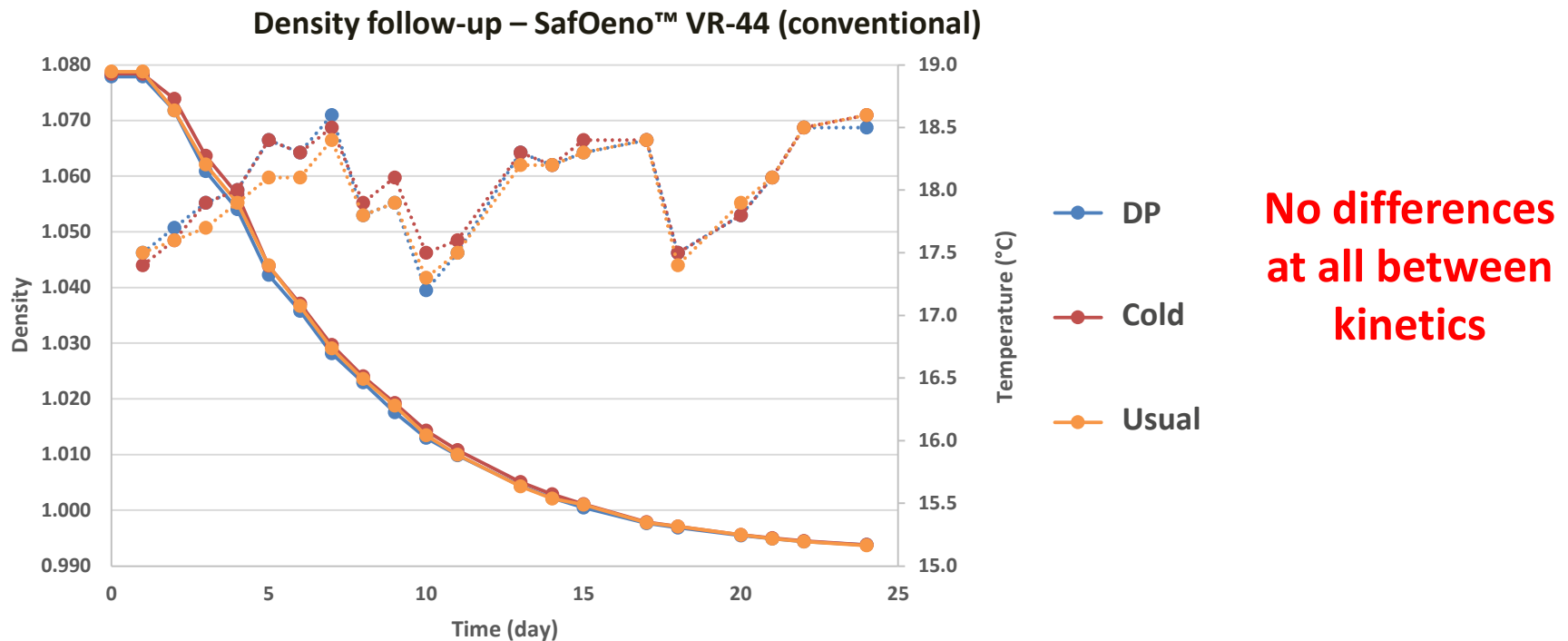
Fermentation at 18°C

Oxygenation at density 1,050 and 1,040

Possible extreme conditions appearing for **base wine fermentation for sparkling wines for which SafOeno™ VR-44 is designed**

3 STEPS - MICROVINIFICATION

2.b Fermentative performances: Impact of usage conditions on kinetics



Rehydration mode → **DP**: Direct Pitch, **Cold**: Rehydration in water at 25°C for 15 min, **Usual**: Rehydration in water at 37°C for 15 min then doubling volume with must and wait for 15 min.

3 STEPS - *MICROVINIFICATION*

2.b Fermentative performances: Impact of usage conditions on analytical parameters

End AF analyses	TAV IRTF (% vol.)	Glucose + Fructose Enzymatic (g/L)	TA IRTF (g H ₂ SO ₄ /L)	VA flow (g H ₂ SO ₄ /L)	pH IRTF	L-malic acid Enzymatic (g/L)	OD 420	Total SO ₂ colorimetric (mg/L)
DP	12.09	3.4	4.41	0.24	3.22	2.8	0.111	41
Cold	12.12	2.9	4.50	0.21	3.25	2.9	0.121	37
Usual	12.1	3.3	4.43	0.23	3.25	3.0	0.108	46

No significant differences!

Rehydration mode→ **DP:** Direct Pitch, **Cold:** Rehydration in water at 25°C for 15 min, **Usual:** Rehydration in water at 37°C for 15 min then doubling volume with must and wait for 15 min.

3 STEPS - *MICROVINIFICATION*

3. Organoleptic profiles: Impact of usage conditions on tasting

	VR-44
Usual vs Cold	Non significant
Usual vs DP	Non significant
Cold vs DP	Non significant

Triangular tasting with 11 expert tasters

No significant impact on tasting

Rehydration mode→ DP: Direct Pitch, **Cold**: Rehydration in water at 25°C for 15 min, **Usual**: Rehydration in water at 37°C for 15 min then doubling volume with must and wait for 15 min.

4.

PRACTICALLY & OUR RANGE OF E2U™ ACTIVE DRY YEAST

RANGE

Already validated

- SafCEno™ STG S101
- SafCEno™ CK S102
- SafCEno™ BC S103
- SafCEno™ SC 22
- SafCEno™ NDA 21
- SafCEno™ HD S135
- SafCEno™ HD S62
- SafCEno™ GV S107
- **SafCEno™ VR 44 (NEW!)**
- **SafCEno™ HD A54 (NEW!)**
- **SafCEno™ HD T18 (NEW!)**
- **SafCEno™ SH 12 (NEW!)**
- **SafCEno™ PR 106 (NEW!)**

Under validation

- ***SafCEno™ UCLM S325***
- ***SafCEno™ UCLM S377***
- ***SafCEno™ VR 44 (BIO)***

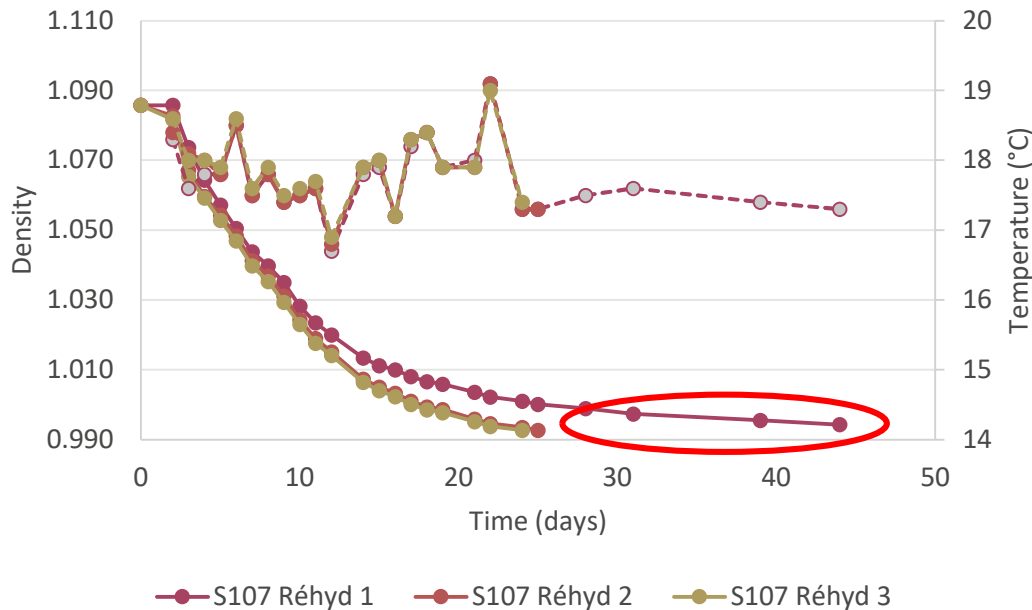


PRACTICALLY

With prior rehydration:

- Pour the yeast on the surface of **10 times their weight of tap water at room temperature**. Gently stir to avoid or break clumps. **Wait for 20 minutes and transfer into the tank via a pumping over with aeration.**

Trial Chardonnay 2018 France – SafOeno™ GV S107



Beware of letting the yeast rehydrating in the water for at least 10-15 min)!!!

To avoid a big osmotic shock

Rehydration mode → **R1**: Rehydration in water at **15°C for 1 min**, **R2**: Rehydration in water at 15°C for 15 min, **R3**: Rehydration in water at 35°C for 15 min then doubling volume with must and wait for 15 min.

PRACTICALLY

Direct inoculation:

- **Dispatch the ADY homogenously into the entire must is the most important!**

Reds

- Spray the ADY homogenously directly on the grapes at reception or,
- Introduce the yeast directly into the juice after destemming/crushing before pumping of the must to the fermentation tank or,
- Introduce the yeast in the liquid phase or ensure the yeast is well homogenized with the liquid phase of the must.

Points of warning:

- **When the dose of ADY is important: ensure a good diffusion in the entire volume**
- **Start to refrigerate the fermentation tank earlier to avoid a too fast fermentation start and a heat peak**

Whites/rosés

- Introduce the yeasts into the juice just after settling during the tank filling or,
- Introduce the yeasts on the surface of the juice when the tank is full then homogenize the juice or,
- *Spray the yeast directly on grapes at reception only if the settling is not strong and temperature is maintained cold all along prefermentation (<10°C) or,*
- *Introduce the yeast into the juice just after pressing only if the temperature is maintained cold (<10°C)*

CONCLUSION

5 PROPERTIES TO REMEMBER

E2U products



1. Make fermentation easier

→ Flexibility while keeping reliability

2. Allow lower consumption of water and/or energy

→ Direct pitch or cold temperature rehydration

3. Reduce pollution

→ Limit detergents' use for cleaning

4. Give you greater safety and convenience

→ Yeast particle inhalation tackling

5. Boost your economy

→ CAPEX and time savings

CONCLUSION

KEY FIGURES



Estimation if all active dry yeast users (~75% of the winemakers) decided not to rehydrate their yeasts...



THANK YOU

Question at a.flesch@fermentis.lesaffre.com

  [Fermentis.com](https://www.fermentis.com)