EMS USA PRESENTS
WINEXPO
TRADE SHOW & CONFERENCE
2012 10th ANNIVERSARY 2022
DECEMBER 1 • SONOMA COUNTY, CA

Simplifying the Use of Active Dry Yeast Through Direct Inoculation or Simple Rehydration

Track: Winemaking
1:00pm - 2:00pm

Conference Track Presented by:

WINE INDUSTRY ADVISOR & AFTERNOON BRIEF NEWS

MODERATOR

Anne Flesch
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Erica Stancliff
Winemaker / Trombetta Family Wines

James Wall
Winemaker / O'Neill Vintners and Distillers

SIMPLIFY THE USE OF YEAST TODAY'S AGENDA

1. HOW IS YEAST IMPLEMENTED TODAY AND WHAT IS AN EASY-TO- USE YEAST?
2. THE TRIALS TASTING TODAY
3. YEAST PRODUCTION EXPERTISE
4. FERMENTIS CERTIFICATION VALIDATION PROCESS
5. HOW TO IMPLEMENT DIRECT PITCHING AT YOUR WINERY
6. WINERIES CASE STUDIES
7. PANEL DISCUSSION
8. CONCLUSION AND Q&A

HOW IS YEAST IMPLEMENTED TODAY AND WHAT IS AN EASY-TO- USE YEAST?

1

YEAST REHYDRATION TODAY

REHYDRATION

ACCLIMATIZATION

Yeast in non chlorine **water** at **35-38**°C

Rehydration agents

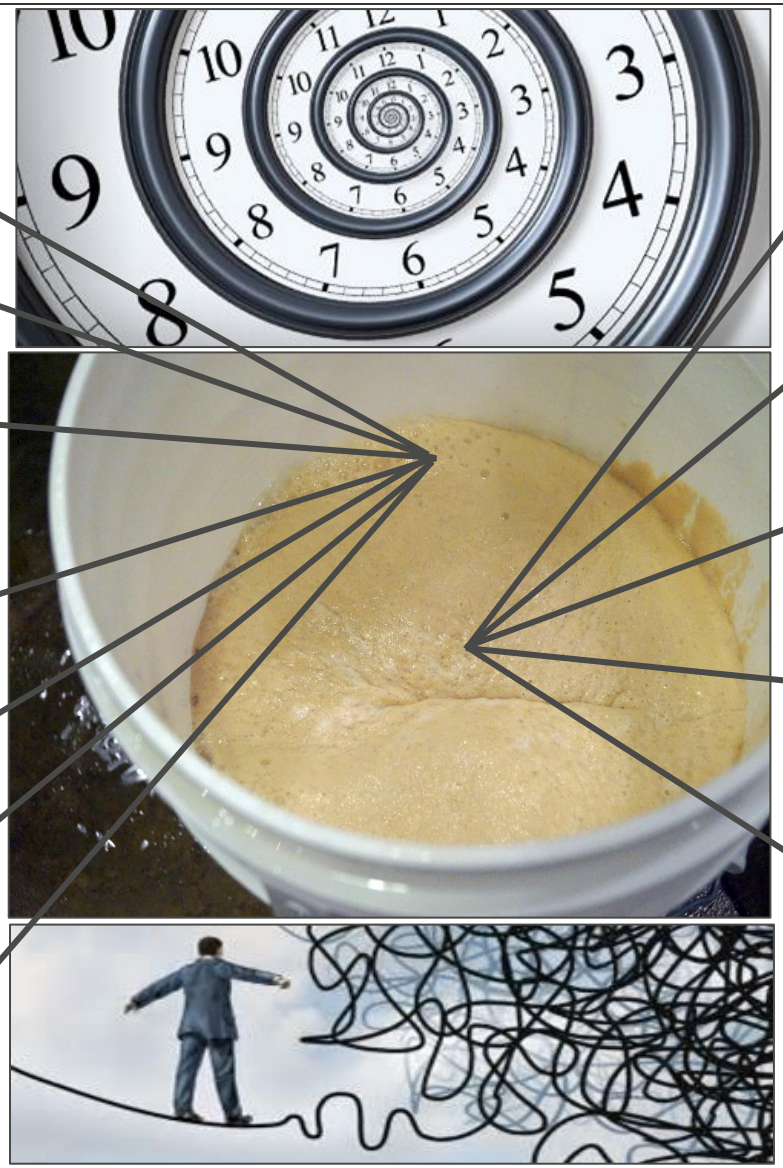
Wait for 15-20 min + homogenization

Mix with must to decrease the temp + **homogenize**

Wait for 5-10 min

Repeat the operation if needed

Transfer into the tank



Cellar **training**

Time consuming: 20-45 minutes

Water + energy consuming

Water **temperature** issues

Mistakes!!!
=Loss viability

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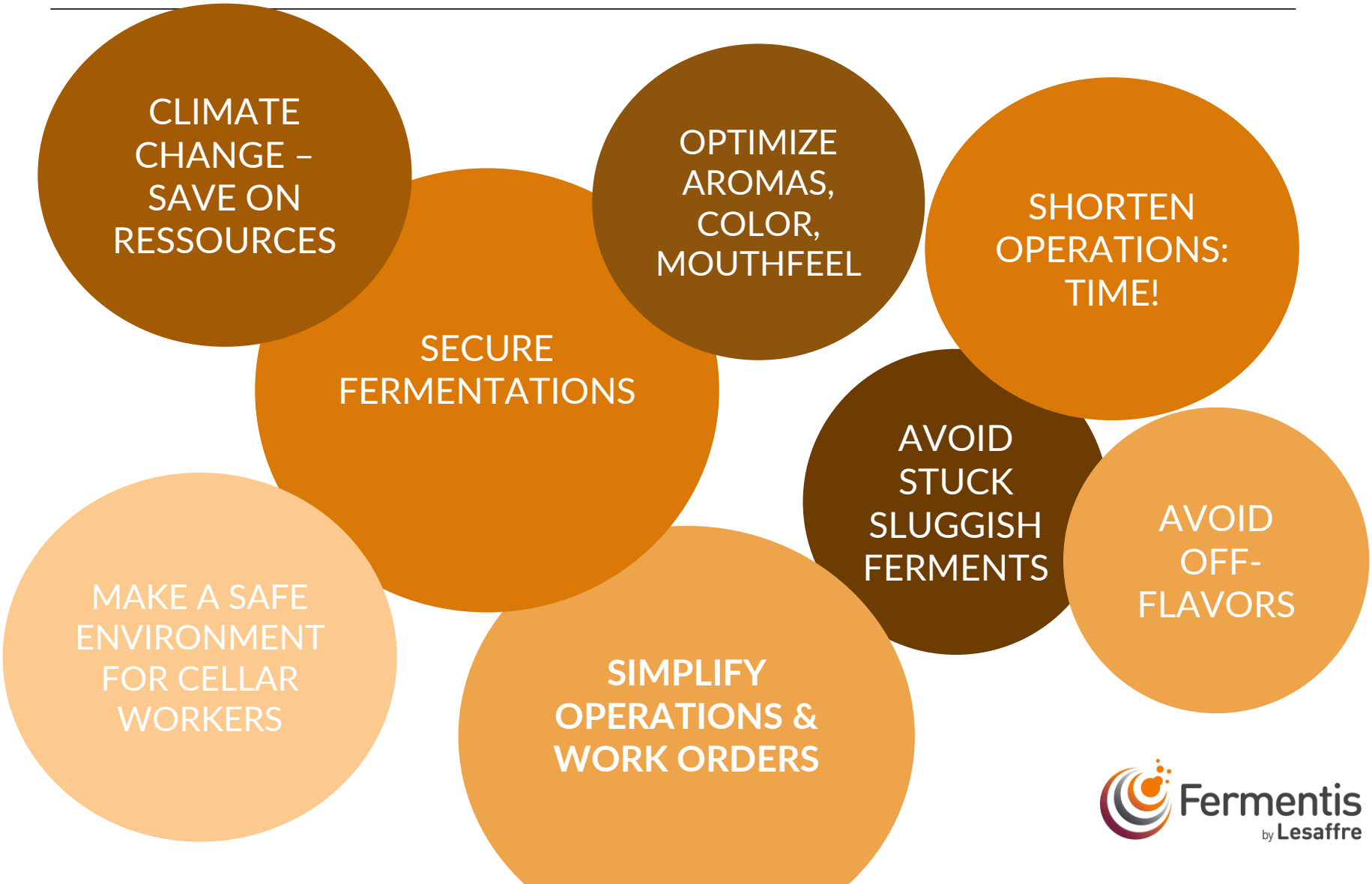
WINEMAKERS CONCERNS DURING HARVEST



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WHAT IS AN EASY-TO-USE YEAST?

- **Fermentis E2U™ (Easy-to-Use)** is a **certification** on Fermentis' SafOeno™ Active Dry Yeast (ADY) that allows the winemakers to **inoculate the yeast in flexible ways.**

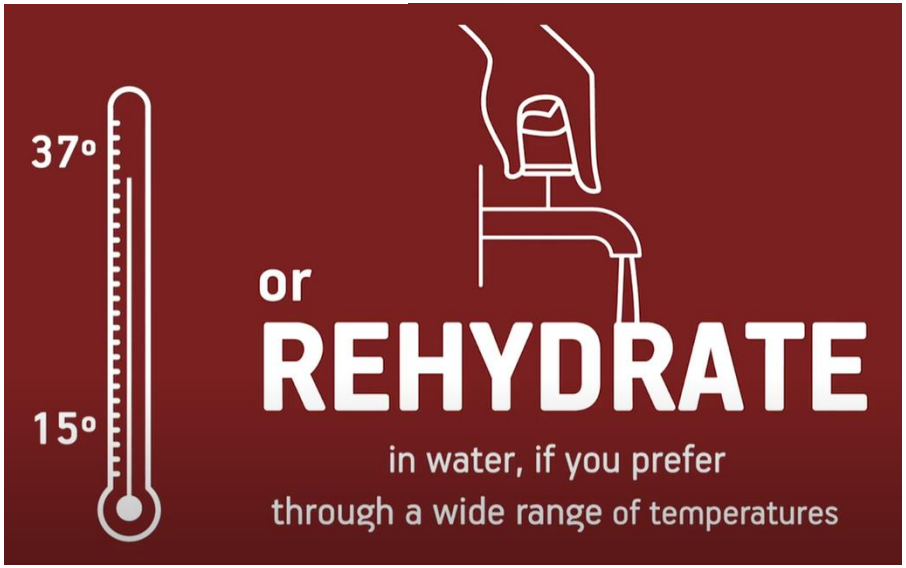
- It is related to an **expert ADY production process** and undergoes a **strict validation process** at Fermentis.

- It **covers most of Fermentis SafOeno™ yeast portfolio** with different aromatic and technical characteristics.

- There are others 'direct pitch' yeasts on the market with different certifications/ recommendations.

INOCULATE IN FLEXIBLE WAYS

CHOOSE
YOUR OWN WAY!



Acclimatization optional

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THE TRIALS TASTING TODAY

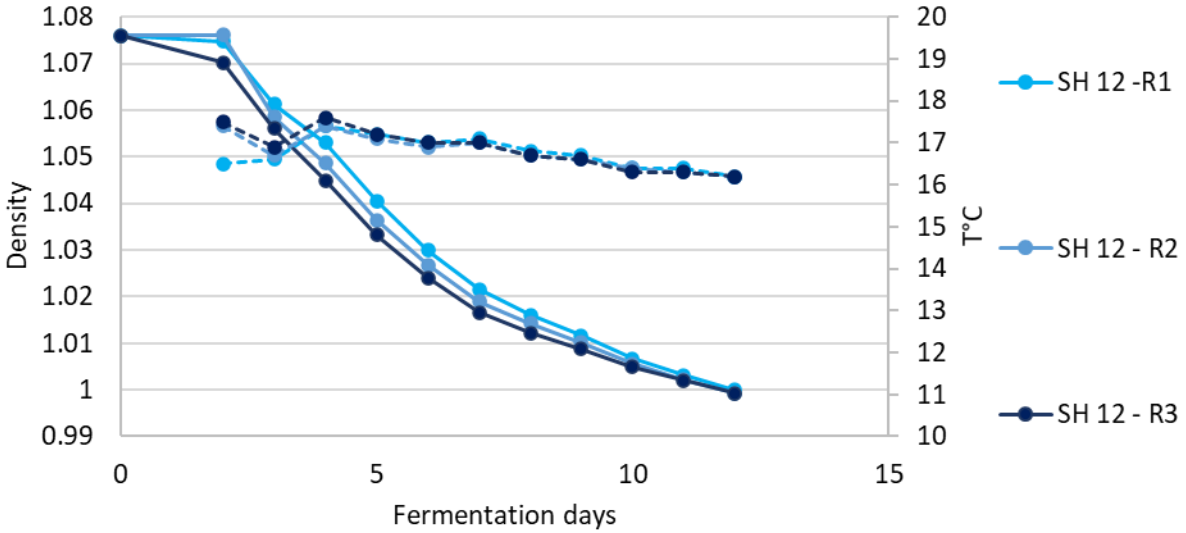
2

WINE TASTING TODAY – TRIAL 1

LOIRE VALLEY, FRANCE
2020
SAUVIGNON BLANC
YEAST SAFOENO SH 12

MUST

Density		1076
Sugars	g/L	177
Turbidity		< 20
pH		3.20
YAN	mg/L	182
Ratio YAN/Sugar		1.03
Titrable acidity	g H2SO4/L	4.71



Inoculation temp: 13°C/ 55°F
Fermentation temp: 17°C/ 62°F
Chaptalisation to 12.1% vol.
Oxygenation at density 1.05

Inoculation conditions:

- **R1** : Direct pitching in the must
- **R2** : Rehydration in cold water (15 min / 15°C) then inoculation
- **R3**: Rehydration (15 min / 35°C) then addition of must

PCR

	At 2/3 ALF
R1	100 % implantation
R2	90 % implantation
R3	100 % implantation

WINES

	ALF (days)	Ethanol (% vol.)	G+F (g/L)	TA (g H2SO4/L)	VA (g H2SO4/L)	pH	Malic acid (g/L)	TSO_2 (mg/L)
R1	17	12.16	< 0.5	4.83	0.29	3.26	3.3	48
R2	17	12.14	< 0.5	4.76	0.28	3.25	3.2	46
R3	17	12.11	< 0.5	4.82	0.28	3.26	3.3	47

WINE TASTING TODAY – TRIAL 2

CLARKSBURG
MERWIN VINEYARD
2022
CHENIN BLANC
YEAST SAFOENO SH 12

Erica Stancliff - PANELIST
Winemaker / Trombetta Family Wines

- Harvested 9/16/22 (4.63 tons) at 22.5 brix
- Direct to bladder press, no destem.
- Yeast inoculated at 57°F with two different modalities R1 and R2
- Fermented in 50% neutral French oak and then 50% stainless steel drums.
- It was a long and slow fermentation between 55-61°F

Inoculation conditions:

- **R1** : Direct pitching in the must
- **R2**: Rehydration (15 min / ~35°C) and acclimatization with must before inoculation

PCR

	Implantation
R1	100 % implantation
R2	100 % implantation

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YEAST PRODUCTION EXPERTISE

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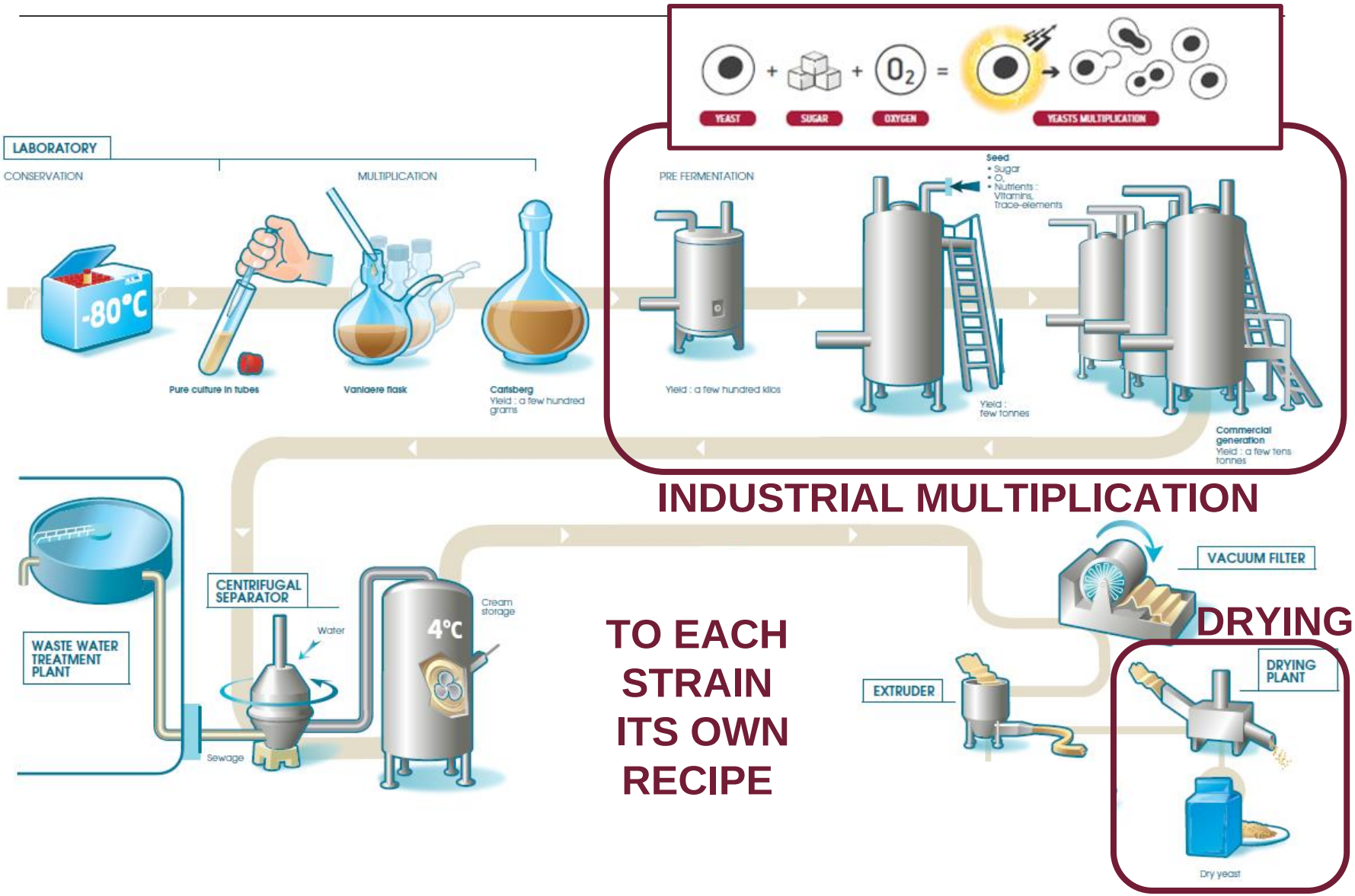
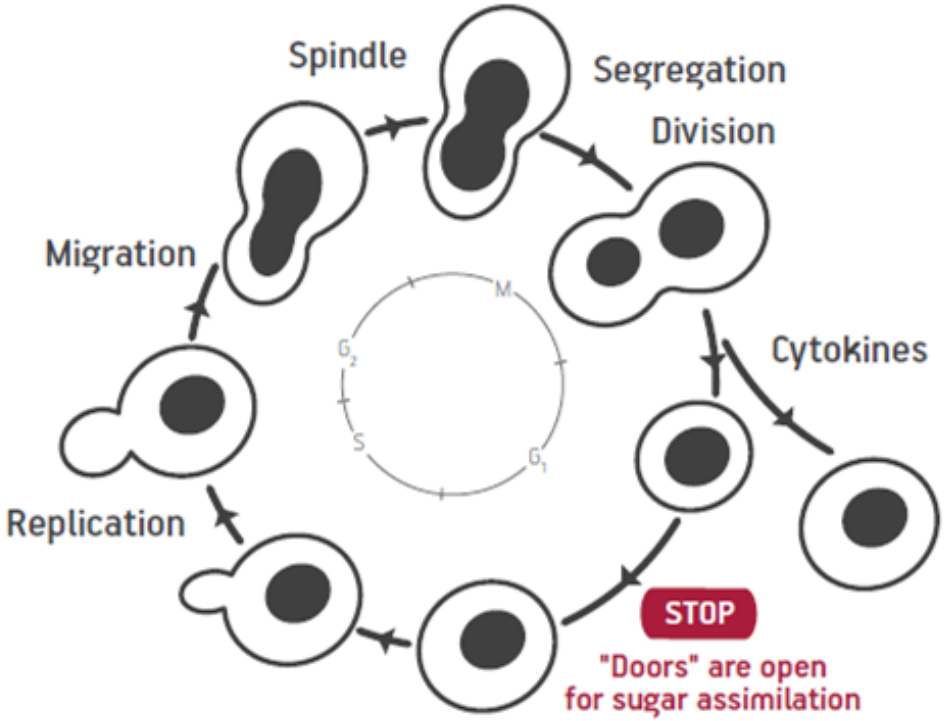
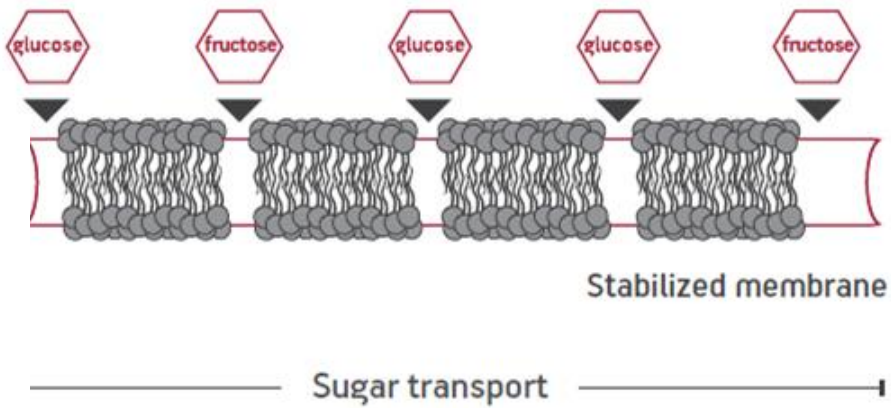
PRODUCTION PROCESS KNOW-HOW



MULTIPLICATION KNOW-HOW

Asexual reproduction (budding cycle)



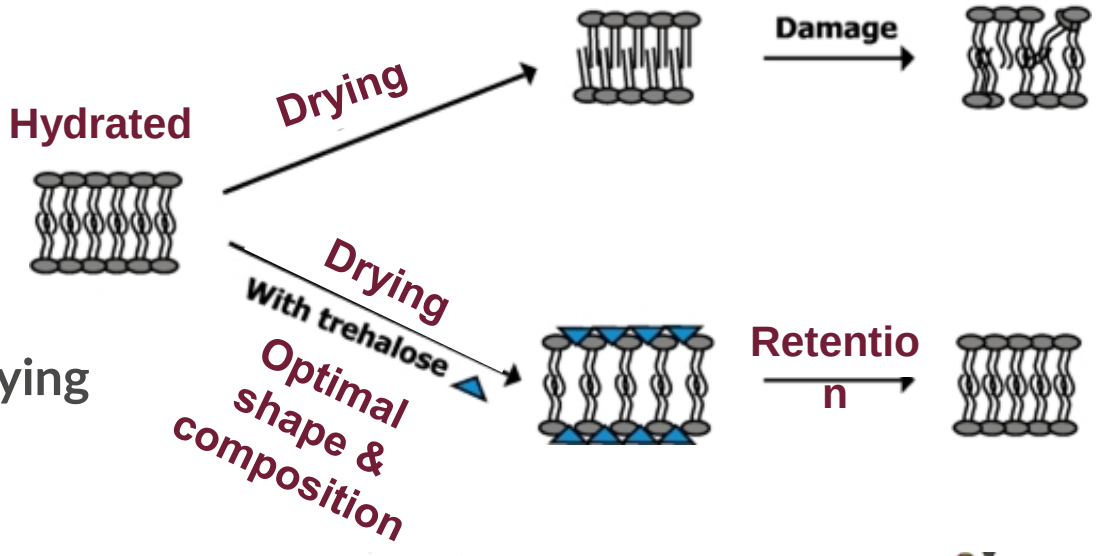


Optimal membrane shape and composition:

- Fix the yeast in its **best physiological state for a direct fermentation** of the present sugars (doors open!)
- **Optimal amount of sterols, glycerol, glycogen and trehalose** for membrane fluidity and protection.
- Addition of vegetable based **emulsifier to cream yeast** to protect

DRYING KNOW-HOW

- Optimize the condition for the yeast to resist to drying and future rehydration



- Adopt the most gentle drying with fluidilized beds

FERMENTIS VALIDATION PROCESS

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2 STEPS TO GET AN E2U™-VALIDATION

IF THE STRAIN SHOWS

- a high and preserved viability in all rehydration conditions
- maintained fermentation performances
- and an equivalent organoleptic profile whatever its mode of preparation

IT IS OFFICIALLY DECLARED E2U™.

1

A TEST OF VIABILITY AFTER REHYDRATION

in pure or up to 25% sugared water and at a range of temperatures from 10°C to 43°C (50°F to 109°F).

2

ONE OR SEVERAL MICROVINIFICATIONS

whose conditions are specifically chosen according to the main types of wine targeted by the selected strain. Prior to the fermentation, the yeasts are prepared in three different ways.

- **THE USUAL WAY**

  Rehydration in tap water at 35/37°C (95/98.6°F), then progressive acclimatization to must temperature, with must addition before inoculation.

- **COLD**

  Rehydration in tap water at 15°C for 15 minutes.

- **MUST**

  Direct pitching.

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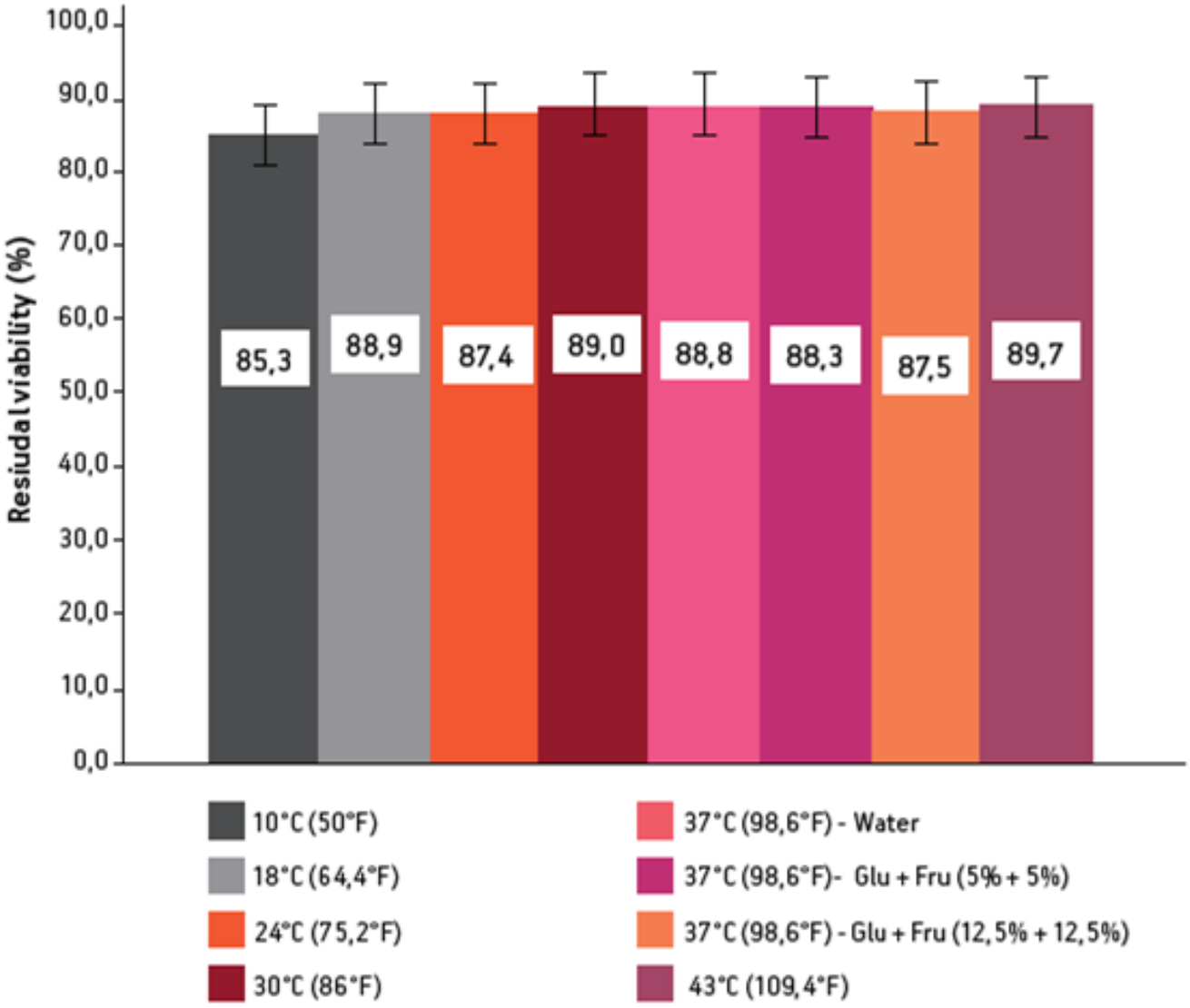
TRIALS FOR E2U™ CERTIFICATION THE EXAMPLE OF SAFOENO™ HD S135



PRESERVED YEAST VIABILITY

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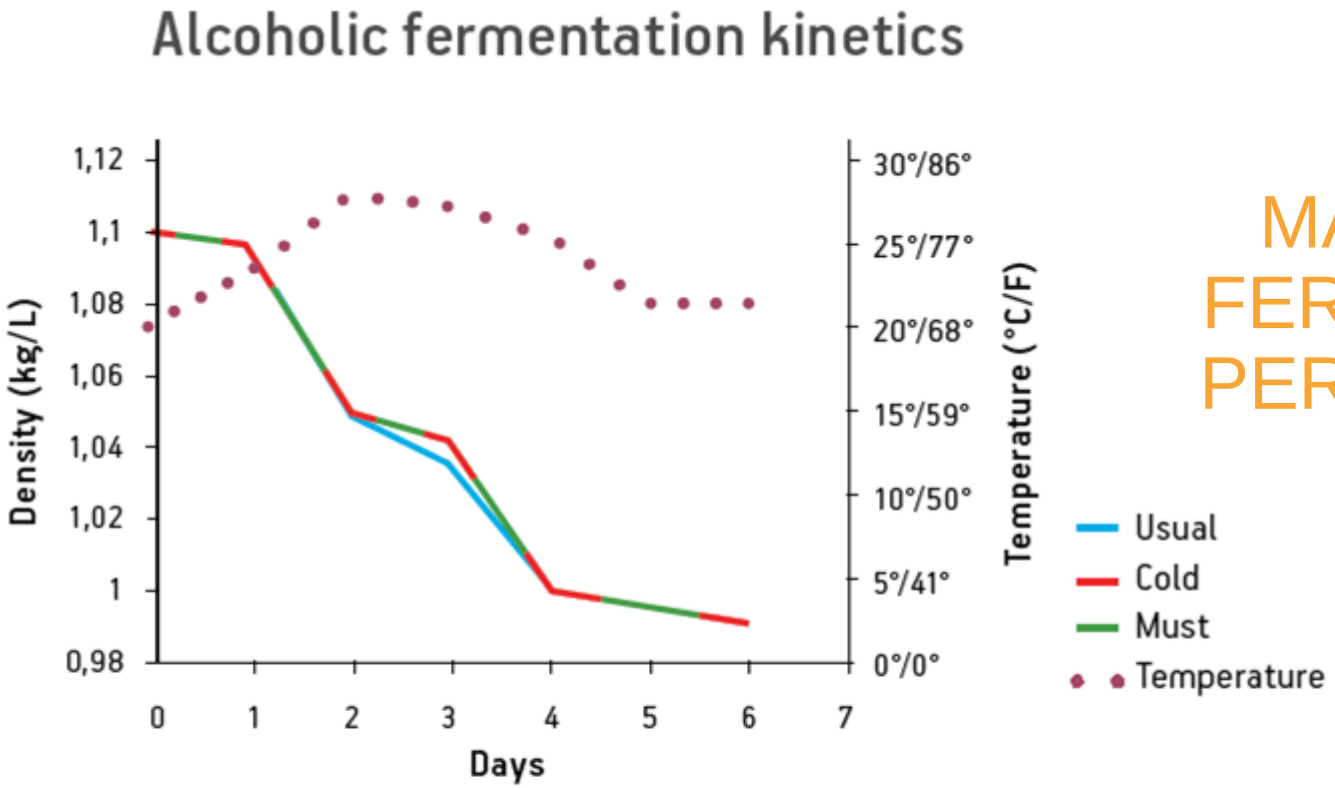
TRIALS FOR E2U™ CERTIFICATION THE EXAMPLE OF SAFOENO™ HD S135



MAINTAINED FERMENTATIVE PERFORMANCES

Yeast preparation conditions: Usual: rehydration in tap water at 35/37°C (95-98,6°F) then progressive acclimatization to must temperature with must addition before inoculation, **Cold:** rehydration in tap water at 15/17°C (59-62,6°F), **Must:** direct pitching. **Dotted line:** average fermentation temperature.

Mendoza, Argentina, Malbec

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TRIALS FOR E2U™ CERTIFICATION THE EXAMPLE OF SAFOENO™ HD S135

TRIANGULAR TASTING

Usual vs Cold	NS
Usual vs Must	NS
Cold vs Must	NS

NS: non significant differences.

Mendoza, Argentina, Malbec

ORGANOLEPTIC PROFILE OF EQUIVALENT QUALITY

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HOW TO IMPLEMENT DIRECT PITCHING AT YOUR WINERY

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DIRECT PITCHING - RED WINES

INTRODUCE THE ACTIVE DRY YEAST DIRECTLY

Option 1: **Spray ADY** (yeast in water suspension) **directly on the grapes homogeneously** at reception.

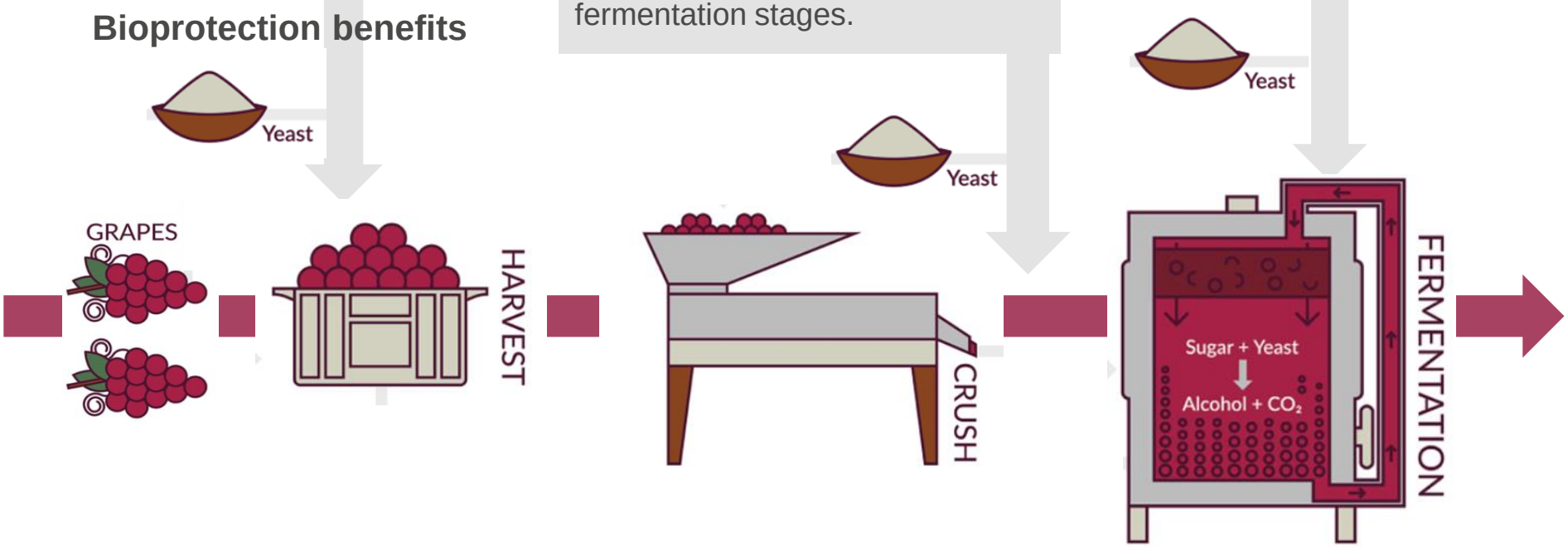
- Maintain <10°C all along pre-fermentation stages.

Option 2: **Pour ADY** (or ADY in suspension in 10x its weight of juice) **directly into the juice after the destemmer-crusher** and before pumping to the fermentation tank.

- Maintain <10°C all along pre-fermentation stages.

Option 3: **Pour ADY** (or ADY in suspension in 10x its weight of juice) **directly into the fermentation vessel** with a **good homogeneization**.

Bioprotection benefits



DIRECT PITCHING – WHITES & ROSES

INTRODUCE THE ACTIVE DRY YEAST DIRECTY

Option 1: **Spray ADY (yeast in water suspension) on the grapes homogeneously** at reception.

- Only with gentle clarification and if the temperature is maintained at <10°C all along pre-fermentation stages.

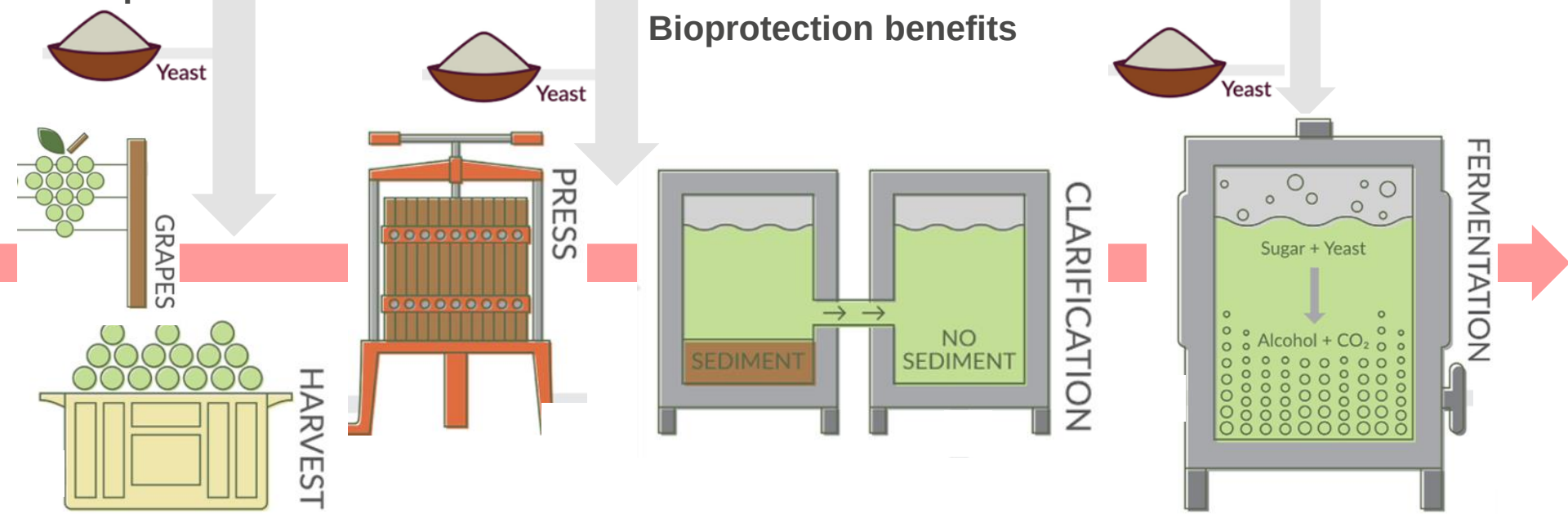
Option 2: **Pour ADY** (or ADY in suspension in 10x its weight of juice) **directly into the must just after pressing** (alt crushing).

- Only with gentle clarification and if the temperature is maintained at <10°C all along pre-fermentation stages.

Option 3: **Pour ADY** (or ADY in suspension in 10x its weight of juice) **directly into the juice during the tank filling** or on the surface of the juice when the tank is full with good homogenization.

Alternative: in barrel.

Bioprotection benefits



ADDITIONAL TIPS TO THE ENOLOGIST

ADY dosage is not affected by the inoculation method. For still wine: 20g/hl.

Recommended nutrition protocol is not affected by the inoculation method. See our protocols.

Always sprinkle the yeast in a **liquid phase**, not on the dry fruit.

Do not add the ADY to the fermenter before the juice/must.

Always ensure a good diffusion/homogeneization to the entire volume rapidely.

Do not add the ADY on top of other additions without homogeneization (acids, KMBS, etc.)

Do not realize hybrids methods between direct pitching and rehydration. If you rehydrate in water, wait at least 15 min before pitching the yeast cream.

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FIELD TRIALS EXAMPLES

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SAFŒNO™ GV S107 TRIAL PROTOCOL

SafŒno™ GV S107 trial was carried out by a **North Coast Winery, California**, with **Chardonnay** form a Central Coast AVA in 2017.

Two Inoculation Conditions:

- **Rehydration:** Rehydration for 20 minutes in tap water at 37°C and acclimatization of 10 min with chardonnay must before inoculation.
- **E2U: Direct inoculation/pitch** of the ADY in the fermentation tank at 55°F

- Fermentations in **25,000 gallons tanks**
- **Juice homogeneized** as well as possible between the two fermenters
- **Additions to the must were also similar between the two tanks** (acidification with tartaric acid and yeast nutrient DAP and yeast autolysate in the first 1/3 of the fermentations).
- **Fermentation temperature target was 55°F/13°C.**
- No malolactic fermentation.

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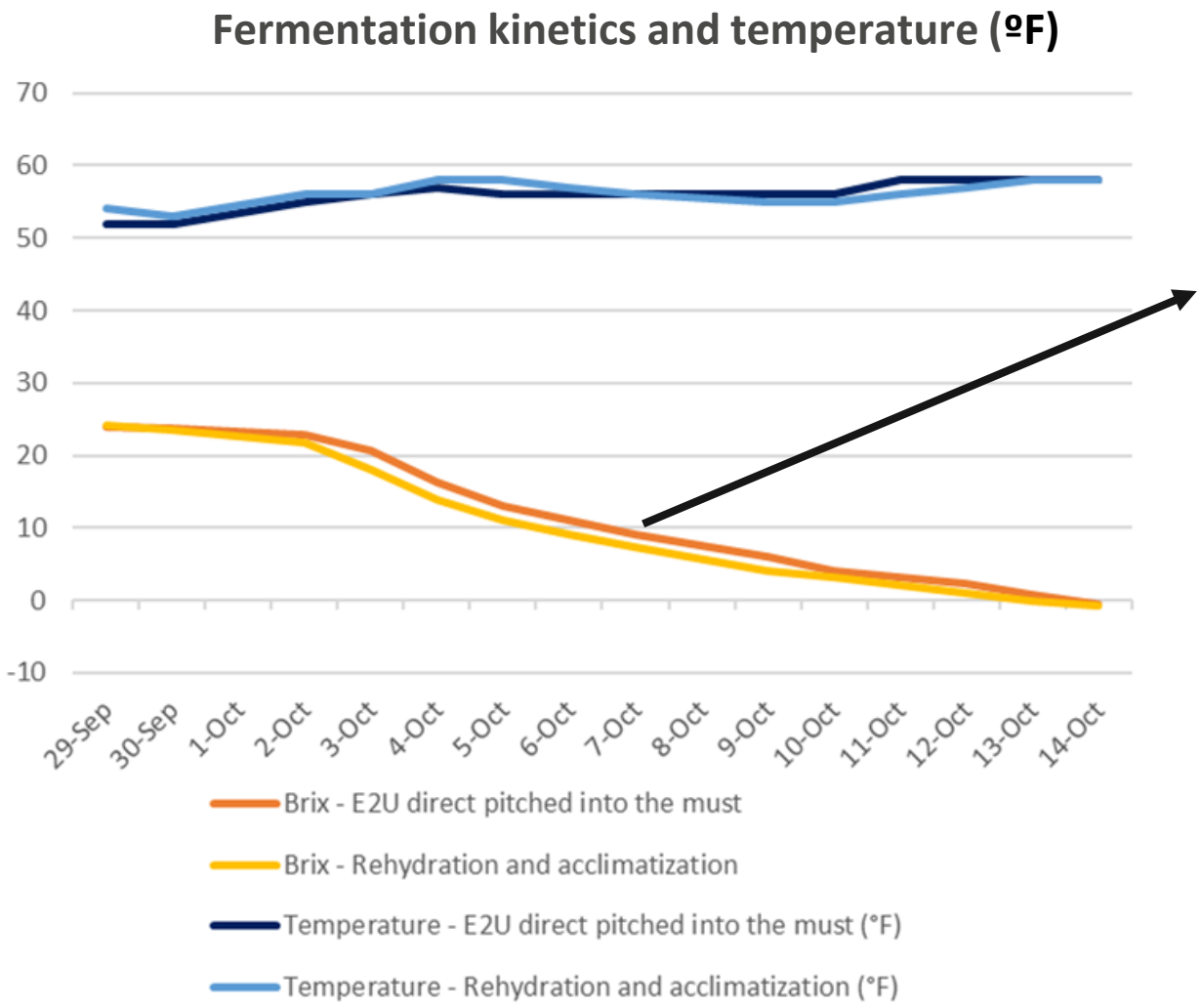
FERMENTATION KINETICS, TEMPERATURE & YEAST IMPLANTATION



PCR analysis at 2/3 AF at ETS laboratory: Both 100% dominated by Safoeno GV S107.

Very good yeast implantation in both cases and fermentation of similar qualities

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MUST AND WINE ANALYTICAL PARAMENTERS

With Rehydration

Pre-fermentation & post-additions

titratable acidity	6.3	g/L
pH	3.53	
L-malic acid	3.45	g/L
tartaric acid	4.5	g/L
brix	23.4	degrees
glucose + fructose	237	g/L
ammonia	152	mg/L
alpha-amino compounds (as N)	147	mg/L
yeast assimilable nitrogen	272	mg/L (as N)
potassium	1680	mg/L

Post fermentation

free sulfur dioxide	<2	mg/L
molecular sulfur dioxide	<0.10	mg/L
total sulfur dioxide	41	mg/L
titratable acidity	6.6	g/L
pH	3.49	
volatile acidity(acetic)	0.28	g/L
L-malic acid	3.07	g/L
L-lactic acid	<0.05	g/L
glucose + fructose	<0.1	g/L
ethanol at 20C	14.53	% vol
ethanol at 60F	14.48	% vol

Wines of similar analytical profiles

E2U direct pitch

Pre-fermentation & post-additions

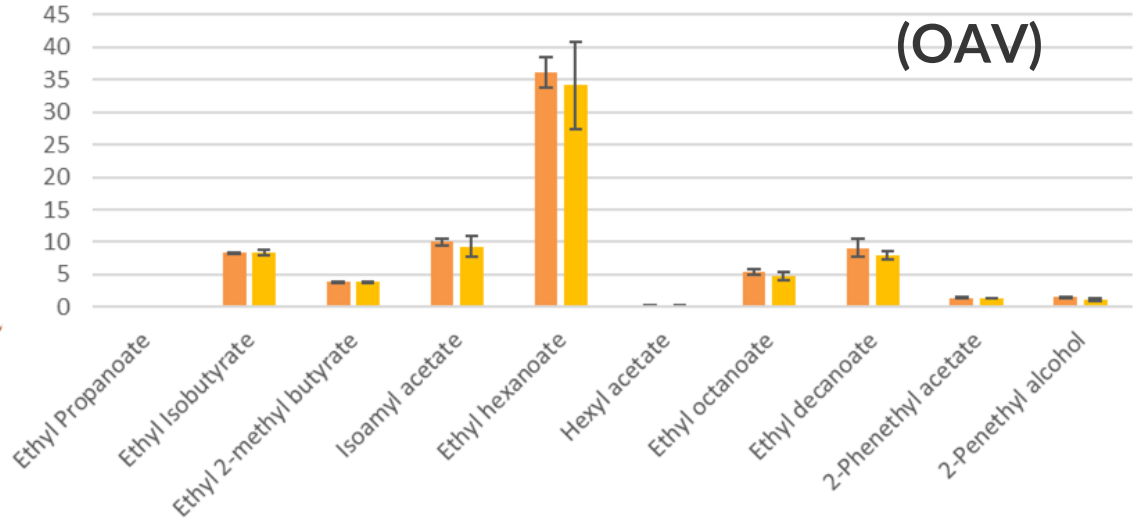
titratable acidity	6.3	g/L
pH	3.53	
L-malic acid	3.49	g/L
tartaric acid	4.6	g/L
brix	23.4	degrees
glucose + fructose	238	g/L
ammonia	139	mg/L
alpha-amino compounds (as N)	150	mg/L (as N)
yeast assimilable nitrogen	264	mg/L (as N)
potassium	1800	mg/L

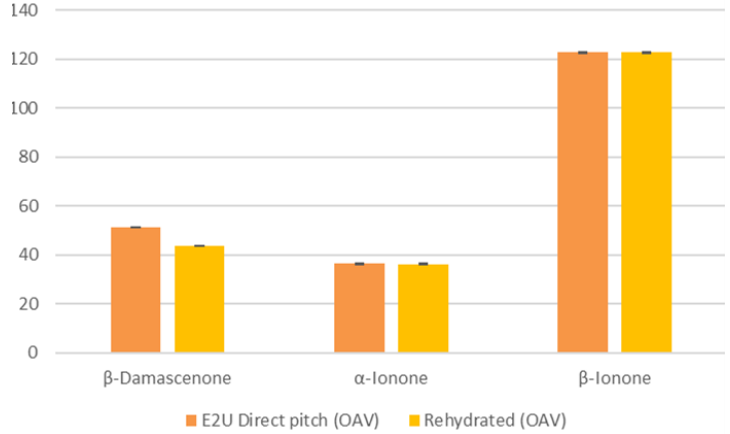
Post fermentation

free sulfur dioxide	<2	mg/L
molecular sulfur dioxide	<0.10	mg/L
total sulfur dioxide	33	mg/L
titratable acidity	6.7	g/L
pH	3.51	
volatile acidity(acetic)	0.28	g/L
L-malic acid	3.06	g/L
L-lactic acid	<0.05	g/L
glucose + fructose	<0.1	g/L
ethanol at 20C	14.57	% vol
ethanol at 60F	14.52	% vol

WINE AROMATICS ANALYSIS

13 key aromatic compounds – esters, higher alcohols, C-13 Norisoprenoids (OAV)





- **Trend of the E2U direct pitch scenario with higher concentration of aromatic compounds but not significant** for most compounds.
- **Only 2/13 molecules are significantly different + toward the direct-pitch wine.**
- With considering **the threshold perceptions, only the β-Damascenone** could significantly affect the wine aromatic perception as aroma enhancer.

Aromatic compounds analysis shows little differences between the wines

TRIANGULAR TASTING & MAIN CONCLUSIONS

Triangular tasting

- 8 people professional panel evaluated 3 sets of triangle tests for a total of 24.
- At the 0.1% level of significance, the wines were perceived to be the same or there was no perceived sensory difference between the two wines.

CONCLUSION

This large scale trial on Chardonnay showed that direct pitching of E2U™ SafOeno™ GV S107 did not affect :

✓ The yeast ability to implant well in the must,
✓ Its fermentation kinetics,
✓ The wine analysis ,
✓ The wine aromatic molecules concentration to a significant amount,
✓ The wine quality as confirmed by a panel of taster.

SAFOENO™ HD A54 CASE STUDIES

Grape

Variety: Maccabeo
Location: Languedoc Roussillon, France
Vintage: 2020

Yeast & Parameters

ADY: SafŒno™ HD A54 at 20g/hl
Long lag phase + overexpressing acetate esters
Pre-fermentation temperature <10°C/50°F
AF temperature: 16-18°C/61-64°F

EXPERIMENTATION A
4 direct pitch inoculation times in pre-fermentative stages

EXPERIMENTATION B
4 inoculation methods in the fermentation tank

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B: IMPACT OF THE MODE OF INOCULATION IN THE FERMENTER

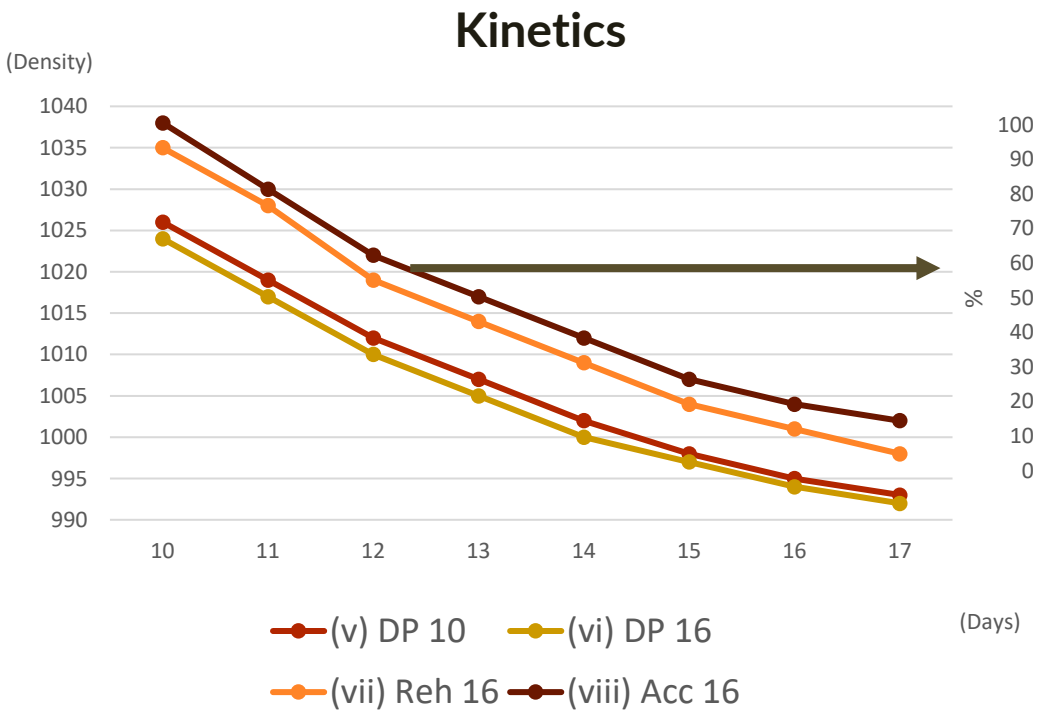
PROTOCOL

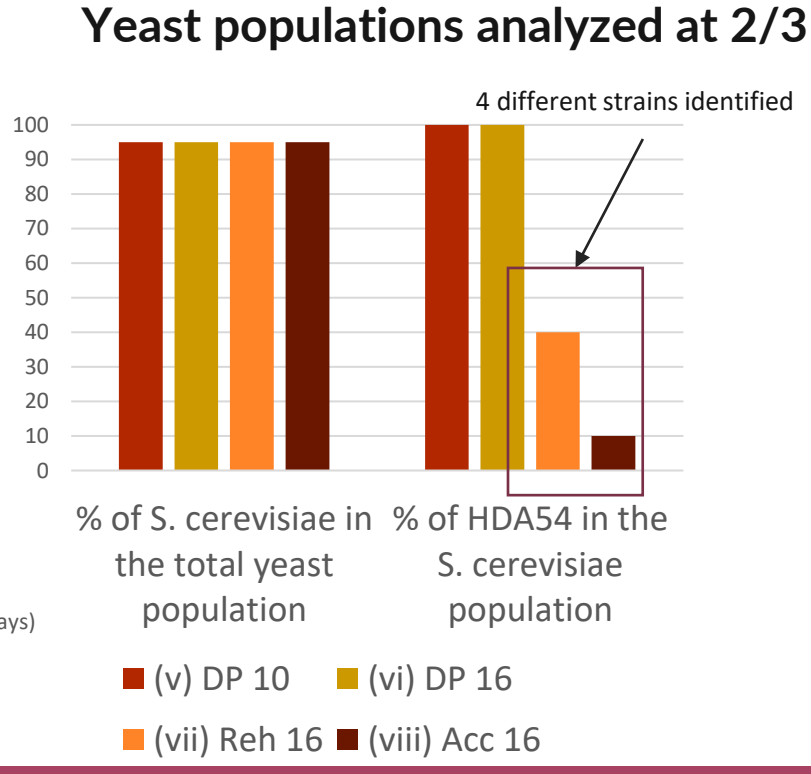
4 inoculation modes in the fermenter (after settling)	Code
Without rehydration, **direct pitch**, T° of must: **10°C**	**(v) DP10**
Without rehydration, **direct pitch** and after T° rise to **16°C**	**(vi) DP16**
With **rehydration** in cold water (18°C) and after T° rise to **16°C**	**(vii) Reh16**
With rehydration in warm water (35°C), **acclimatization** and after T° rise to **16°C**	**(viii) Acc16**

B: IMPACT OF THE MODE OF INOCULATION IN THE FERMENTER

RESULTS

Kinetics and microbial population in the fermentative phase





Significative differences in kinetics that can be explained by a better implantation for the direct pitch scenarii.

? Advantage of DP to save time in must with high microbial load?

B: IMPACT OF THE MODE OF INOCULATION IN THE FERMENTER

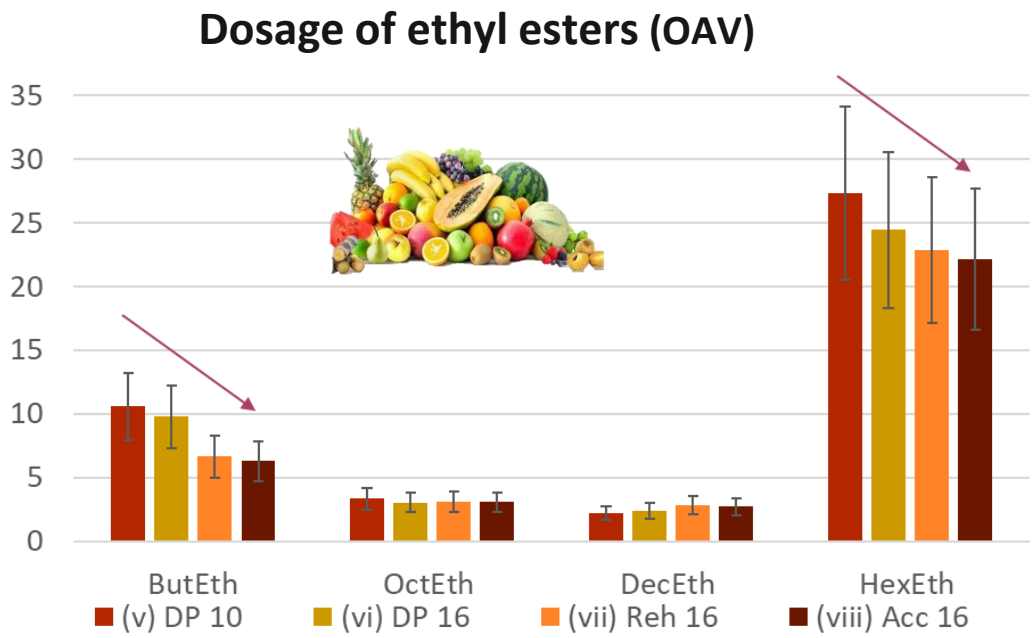
RESULTS

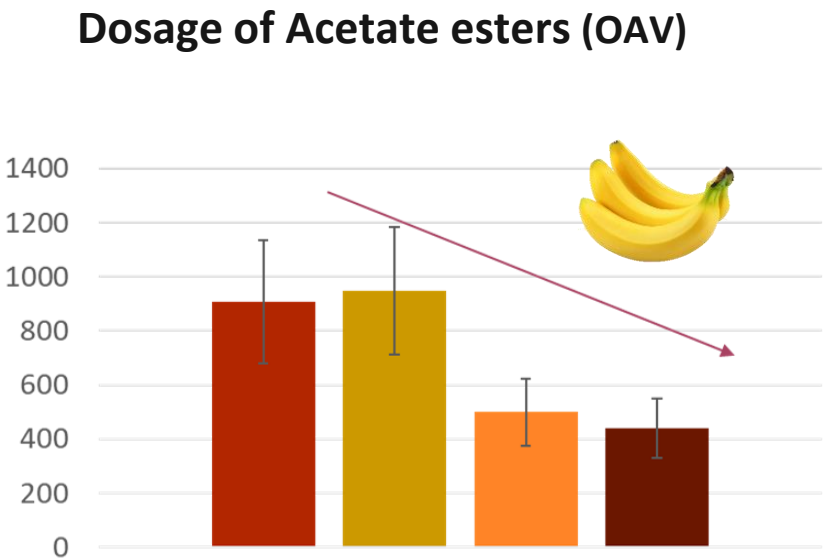
Wines' analytical parameters

	(v) DP 10	(vi) DP 16	(vii) Reh 16	(viii) Acc 16
ABV (%)	15.29	15.27	15.27	15.19
Glu+Fru (g/L)	1	0.7	1.5	2
Total Acidity (g/L tartaric acid)	5.95	6.04	5.99	6.18
Volatile Acidity (g/L acetic acid)	0.28	0.32	**0.45**	**0.55**
Total SO_2 (mg/L)	60	64	67	66
Free SO_2 (mg/L)	15	16	12	12
pH	3.23	3.23	3.25	3.24
Malic acid (g/L)	1	1	1	1
Total ethanal (g/L)	21	19	27	29
Lactic acid (g/L)	0.2	0.2	0.2	0.1

Significative differences especially in volatile acidity due to lower implantation rate/more strains identified in Reh16 and Acc16.

B: IMPACT OF THE MODE OF INOCULATION IN THE FERMENTER





Significative differences for the isoamyl acetate concentration between the wines and a trend for some ethyl esters… resulting in significative differences in the tastings.

Tasting with

- ✓ 18 different variables
- ✓ 6 professional tasters
- ✓ ANOVA statistic analyses
- **SIGNIFICANT DIFFERENCE especially for amylic perception.**

SAFOENO™ HD A54 STUDIES - MAIN CONCLUSIONS

EXPERIMENTATION A
4 direct pitch inoculation times in pre-fermentative stages

✓ **Some E2U™ certified strains can be direct pitched at different pre-fermentative stages** with similar performances.

✓ **With precaution:** maintain temperature < 10°C in pre-fermentation phases and appropriate yeast selection.

EXPERIMENTATION B
4 inoculation methods in the fermentation tank

✓ In most cases no impact of direct pitching vs rehydration…

✓ But **in some cases positive impact of direct pitching allowing to occupy ecological niche sooner** especially in must coming with high microbial load and/or bad sanitary state.

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PANEL DISCUSSION

7

PANEL INTRODUCTION

Anne Flesch - MODERATOR
Technical Sales Support Manager, the Americas / Fermentis

Han Han - PANELIST
Senior Winemaker / Bear Creek Winery

Erica Stancliff - PANELIST
Winemaker / Trombetta Family Wines

James Wall - PANELIST
Winemaker / O'Neill Vintners and Distillers

James Roblee - PANELIST
Technical Support Representative / ATPGroup

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PANEL DISCUSSION

What were your apprehensions/questions before direct pitching ? What did you expect could happen when changing your inoculation method**?**
What is your overall experience with direct pitching? What type of wine(s)fermentation(s)/yeast(s) did you use? How did you proceed with direct pitching practically at your winery? What is your global experience?
What are the benefits you think it gives you when compared to a more traditional way of using yeasts?
Are you/would consider continuing direct pitching?

CONCLUSIONS AND Q&A

8

MANY POTENTIAL BENEFITS

YOU

SAVE TIME

&

GAIN COMFORT

YOU **INCREASE WORKERS' SAFETY**

YOU **MAKE SAVING** ON LABOR, REHYDRATION EQUIPEMENT AND PRODUCTS

YOU **REDUCE HUMAN'S MISTAKE**

WITHOUT COMPROMISE ON THE QUALITY:

- FERMENTATION
- YEAST CHOICE
- FINAL PRODUCT

YOU **ACT GREEN** BY REDUCING POLLUTION AND USE OF RESOURCES

Thank you for your attention!
Any questions?

Please send your questions to a.flesch@fermentis.lesaffre.com

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