

#### Yeast Nutrition for cider fermentation

Cider Industry Technical Day, Friday 23rd June 2017

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Yeast nutrients classes

• Effect of yeast nutrients on the yeast cells

Application of yeast nutrients



## **Sporulation of Saccharomyces Cerevisiae**





## Stress on the Yeast Cells





### Yeast Nutritions – "the four classes"

#### Anorganic nitrogen:

DAP (Diammoniumphosphate) DAS (Diammoniumsulfate) "Fermentation salt"

#### Lipids / Sterol:

Middle chain fatty acids Long chain fatty acids Ergosterols Organic nitrogen: (Proline), Arginine

#### minerals / vita...

Mg (Magnesium), K (Potassium), Na (Sodium) Vitamin B<sub>1</sub> ("Thiamine"), Vitamin B<sub>2</sub> (Riboflavin)



# **Nutrient Demand and Juice Analysis**

Demand of yeast nutrients	Analysis of Juice
<ul> <li>Salts (without N)</li> <li>Trace elements</li> <li>Vitamins</li> <li>Nitrogen compounds</li> </ul>	No No No Partly (FAN, YAN)
for yeast nearly not important	yes Brix yes Acidity yes pH



6

# Development of yeast nutrients during the process

• Apple

• Juice

• Fermentation

• MLF

Natural decline during the cider production











Yeast nutrients classes

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## Optimale fermentation– all yeast nutrients are avialable



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# Fermentation, only with DAHP/DAP/Fermentation salt addition





#### Nitrogen: Why is anorganic nitrogen « Fast Food » ?





## Yeast "Fast Food" – What does it mean!



© cheap, only <u>one synthetic yeast</u> <u>nutrient</u>

© fast fermentation start due to sporulation

<sup>⊗</sup> High SO<sub>2</sub>-demand

 high production of negative S-offflavour (rotten eggs, asparagus)

⊗ taste – soapy (change in pH)

🙁 short, "not full bodied"



## Fermentation – with complex nutrients



## What is "Slow Food"

#### Lipids / Sterols:

Middle chain fatty acids Long chain fatty acids Ergosterole veast cell wall preparation "

#### Minerals / Vitamins:

Mg, K, Na, Vitamin B<sub>1</sub> ("Thiamine"), Vitamin B<sub>2</sub> (Riboflavine)

"yeast cell wall preparation"

Organic nitrogen: (Proline), glutamine acid, "yeast cell wall preparation" all essential bio-nutrients are available for the yeast

 better production of fermentation aroma

better sensorical & apple variety typicity

Iow production of reductive notes

© better fresh and fruity cider

A higher price in comparison to DAP

#### "yeast is, get's and will be fit!"

# **Definition of complex nutrients**

Inactive yeast	Yeast autolysate	Yeast cell wall
(= activator) <u>SIHA SpeedFe</u> For rehydration AC		(= organic certified nutrient) SIHA Proferm Bio During the alcoholic fermentation
SIHA Proferm Fit	(= organic nutrient with added value) <u>SIHA Proferm Fit</u> Enriched with Tripetide Glutathion for juice and during the alcoholic fermentation	(= complex nutrient ) <u>SIHA Proferm Plus</u> Vit/M During the alcoholic fermentation Lip/S
SIHA Proferm Red	(= organic nutrient with added value) <u>SIHA Proferm Red</u> For a better aroma liberation	



# Application



Juice/water-mixture (50/50)

+ SIHA SpeedFerm

Cool down to must

temperature of fermentation tank Fermentation tank



#### What the yeast needs and what can be added...





"Fermentation salt " Anorganic nitrogen DAP, DAS 100% anorganic nitrogen

- cheap, only <u>one synthetic yeast</u> <u>nutrient</u>
- fast fermentation start due to sporulation
- ⊗ High SO<sub>2</sub>-demand
- igh production of negative S-off -flavour (rotten eggs, asparagus)
  taste - soap (change in pH)
  short, "not full bodied"

#### " yeast is fat but not fit!"



#### Complex nutrient 100 % essential bio-nutrients

- all essential bio-nutrients are available for the yeast
- better production of fermentation aroma
- better sensorical & apple variety typicity
- © low production of reductive notes
- © better fresh and fruity cider
- B higher price in comparison to DAP

#### " yeast is, get's and will be fit!"

"Le Penseur" - Auguste Rodin





# Yeast Nutrition for cider fermentation Thank you for your attention!

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