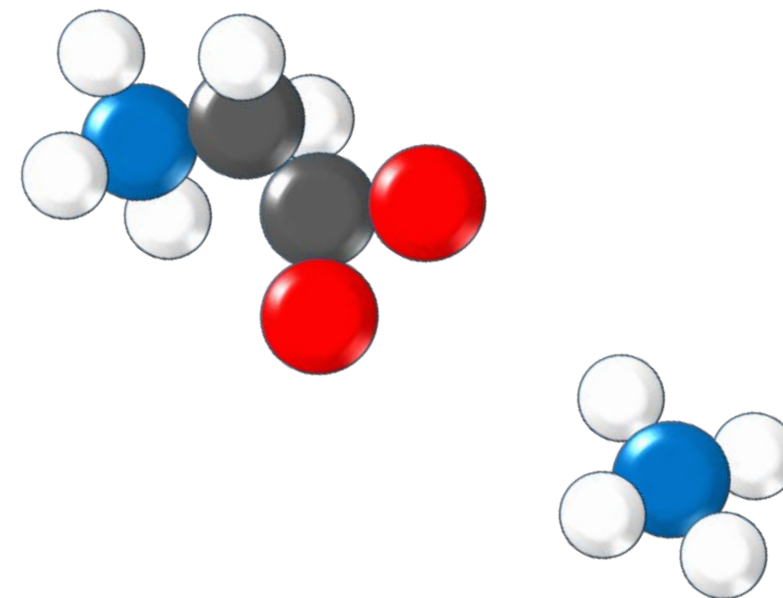


YEAST ASSIMILABLE NITROGEN

A study on Swedish grapes 2017

Sveneric Svensson
Chairman Svenskt Vin

NITROGEN SOURCES FOR THE YEAST



Organic

Free amino acids (FAN)

Proline

All the other

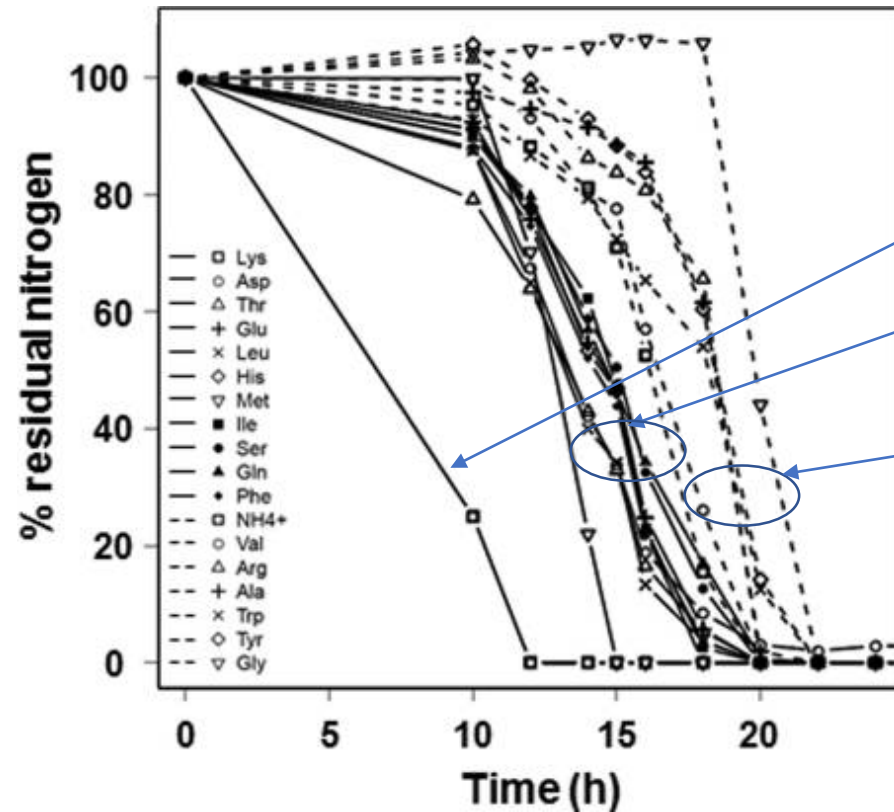
In-organic

Ammonium (NH_4^+)

Yeast Assimilable Nitrogen YAN
= Nitrogen that can be used by the yeast

ASSIMILATION OF NITROGEN AFTER INOCULATION

Crépin Appl. Environ. Microbiol. 2012 78 8102-8111



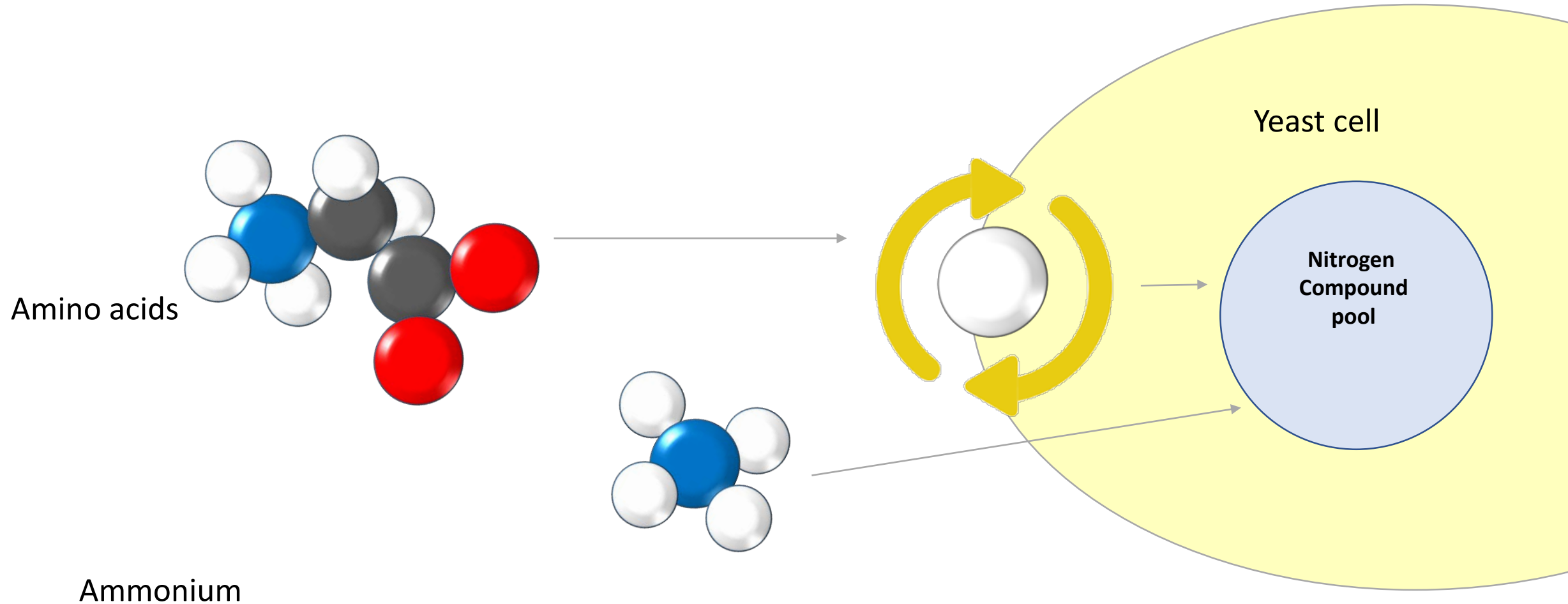
Ammonium is taken up first

Next is a group of amino acids

Finally the rest of amino acids

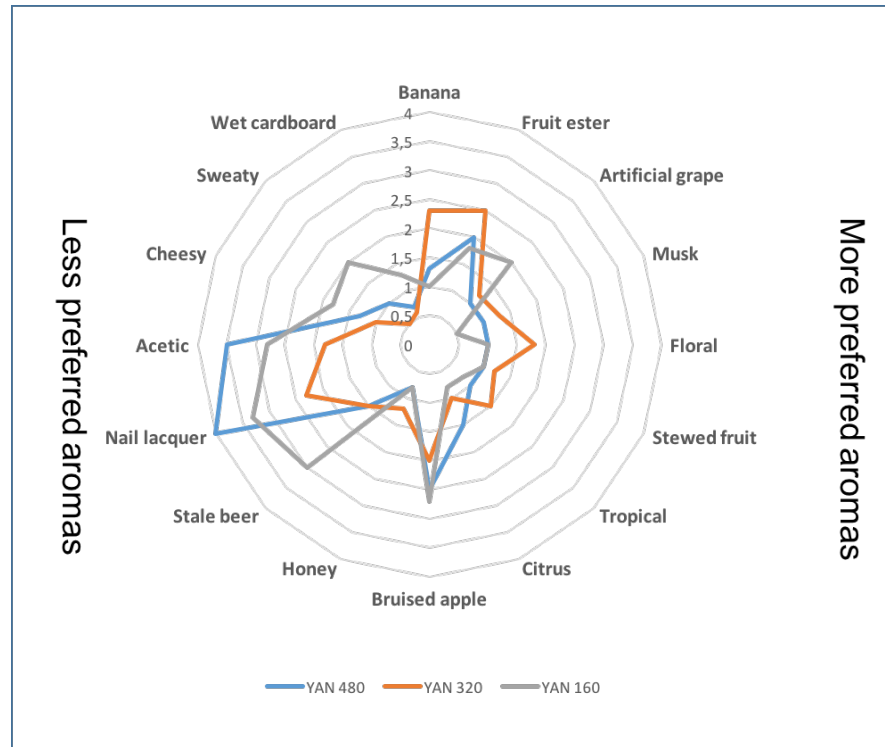
All YAN is assimilated within 20 – 30 hours

YEAST UPTAKE OF AMINO ACIDS AND AMMONIUM



Don't add ammonium (DAP) before start of fermentation

WHY SHOULD WE BOTHER ABOUT NUTRITION?



Australian Wine Research Institute

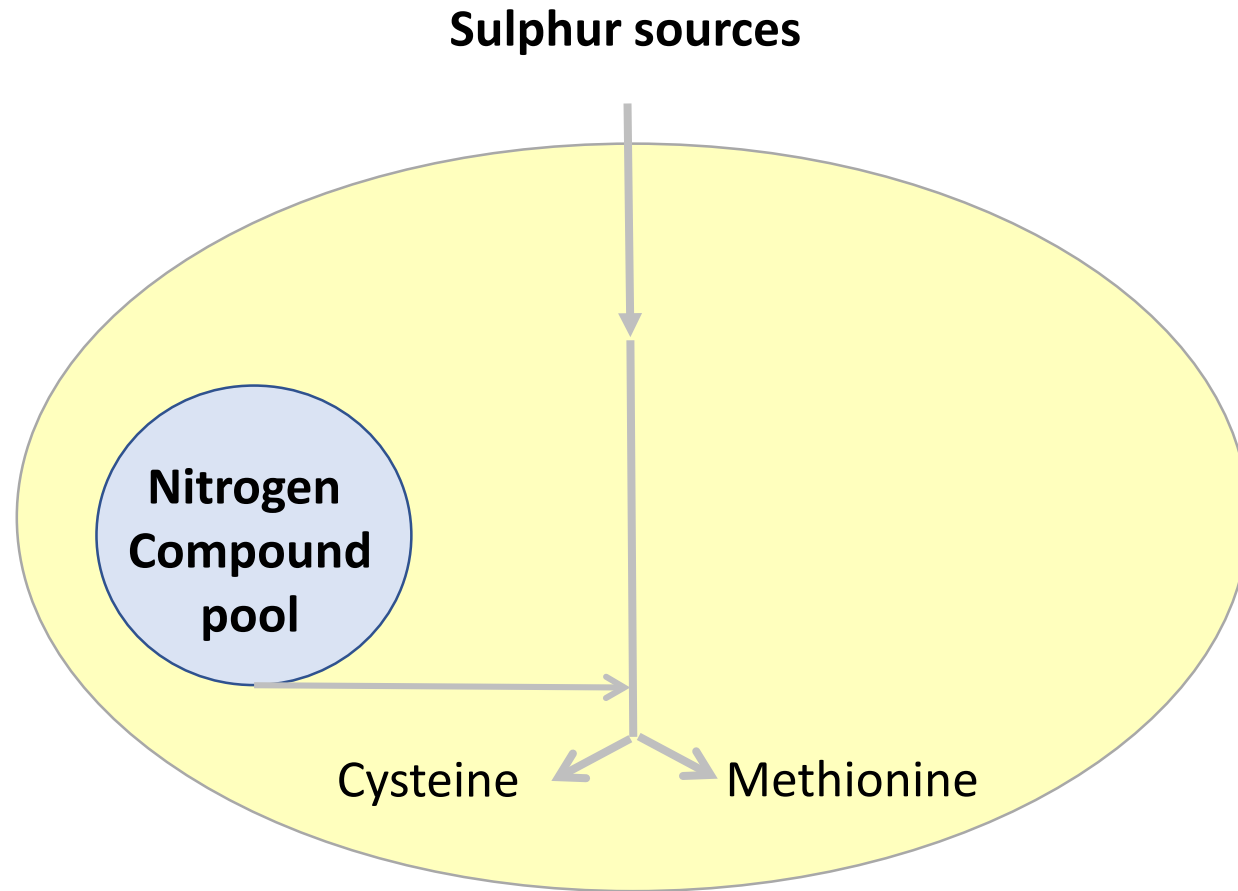
Low YAN musts have risk of sluggish or stopped fermentation – small or dead yeast population

Low YAN may cause nitrogen deficiency with high production of H₂S

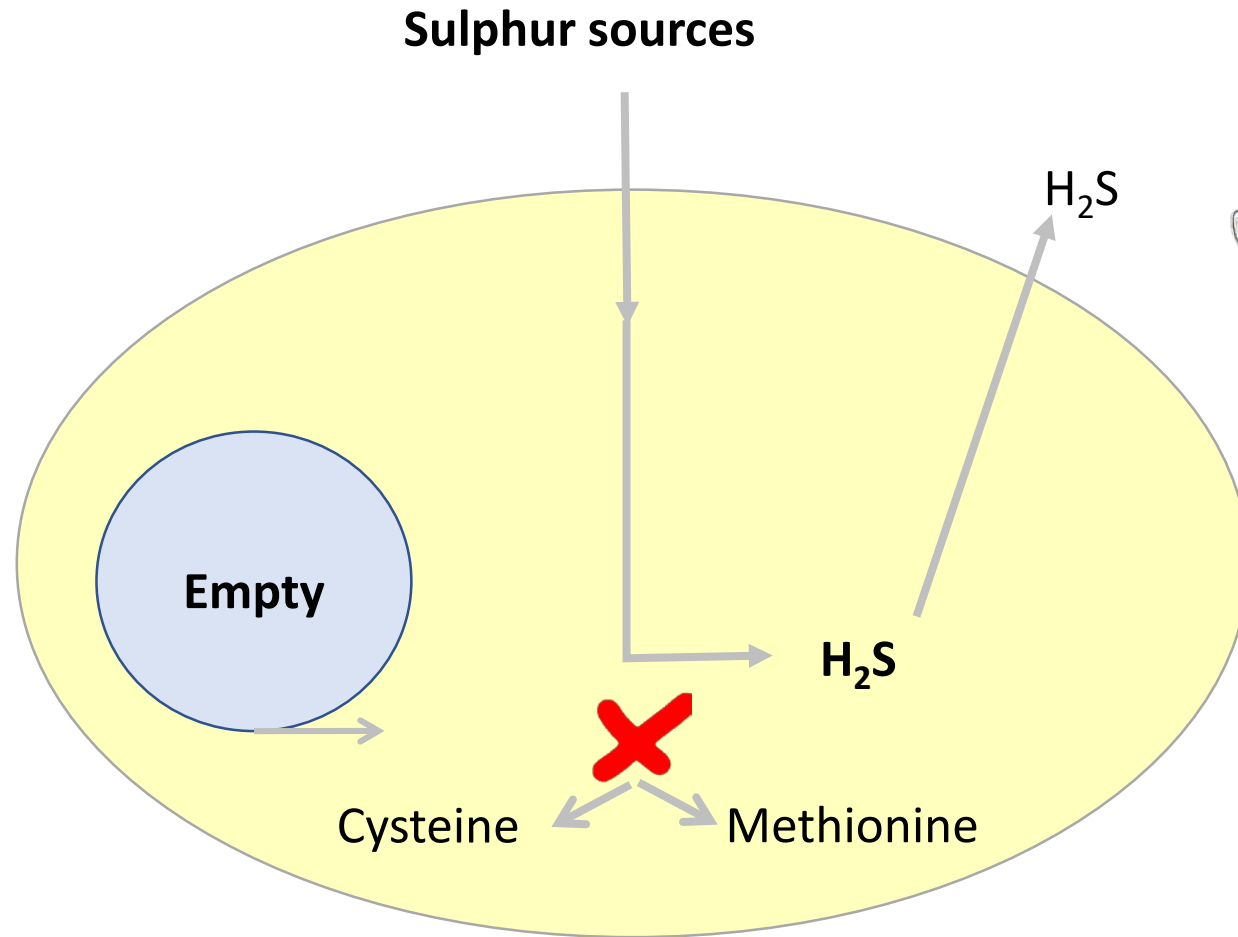
Too high levels may cause a too large yeast biomass with starvation mid fermentation

Too little or too much YAN both impair wine quality

YAN AND HYDROGEN SULPHIDE PRODUCTION



YAN AND HYDROGEN SULPHIDE PRODUCTION



THE GOOD LEVEL OF YAN – BRIX DEPENDENCY

	OE	BRIX	SUGGESTED YAN MG/L
Sweden 2017	90	21	225
	95	22	250
	100	23	275
	105	24	300
	Sweden 2016	110	25

From: naniamowinemakers.com

The demand on YAN is depending on how much work the yeast should be doing
However never ferment with values below 200 mg/L

WHAT IS THE NITROGEN LEVEL ?



METHODS FOR ANALYSING YAN IN GRAPE MUST

In order to supplement YAN to the desired level we need to know the YAN level in the must



1. The formol method - a classical method involving formaldehyde

Want to avoid

2. Enzymatic method

My choice

3. HPLC

Expensive

CDR WINE LAB TOUCH SPECTROPHOTOMETER



Powered with LED lamp

Pre set light channel 366 nm for measurement of absorbance

Kit contains enzymes

Accurate pipetting critical

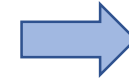
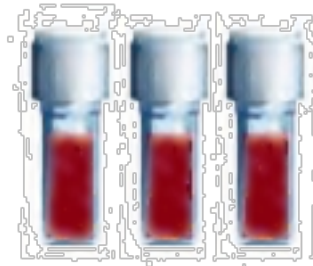


THE PRINCIPAL OF ANALYSIS OF ORGANIC YAN

Sample with amino acids



added to Reagents In the kit including NAD^+



NADH



Absorbs light of 366 nm

Absorbance correlated to content of amino acids

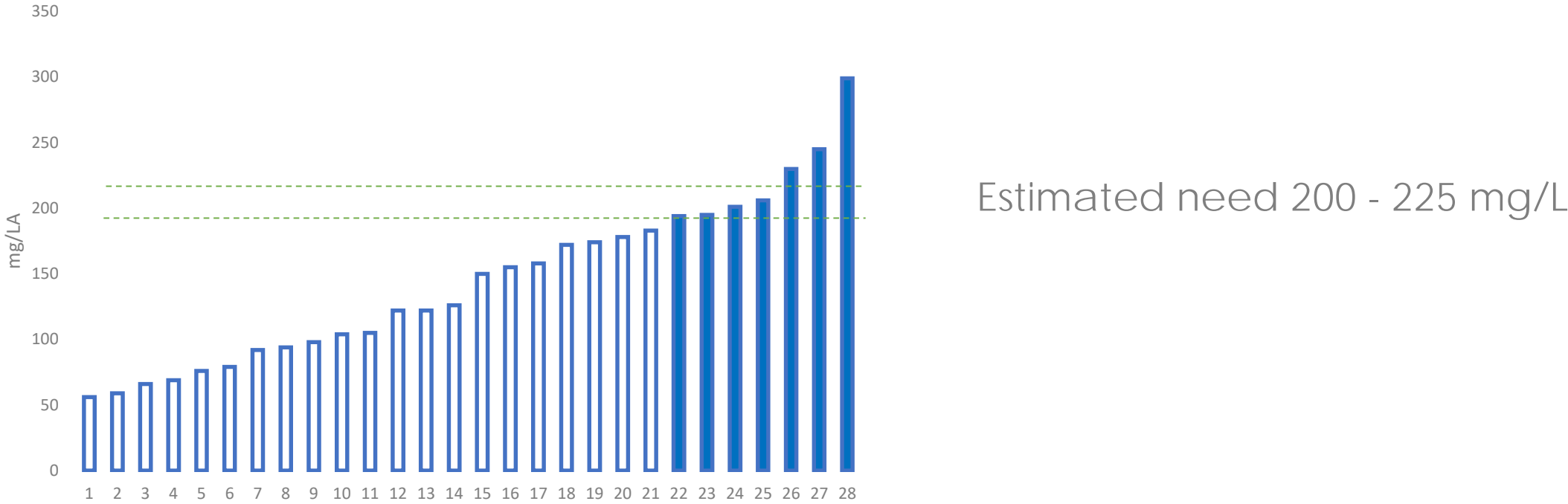
ANALYSIS DONE 2017 ON SWEDISH GRAPE MUST

Solaris	28
Rondo	8
Other blue	3
Total	37



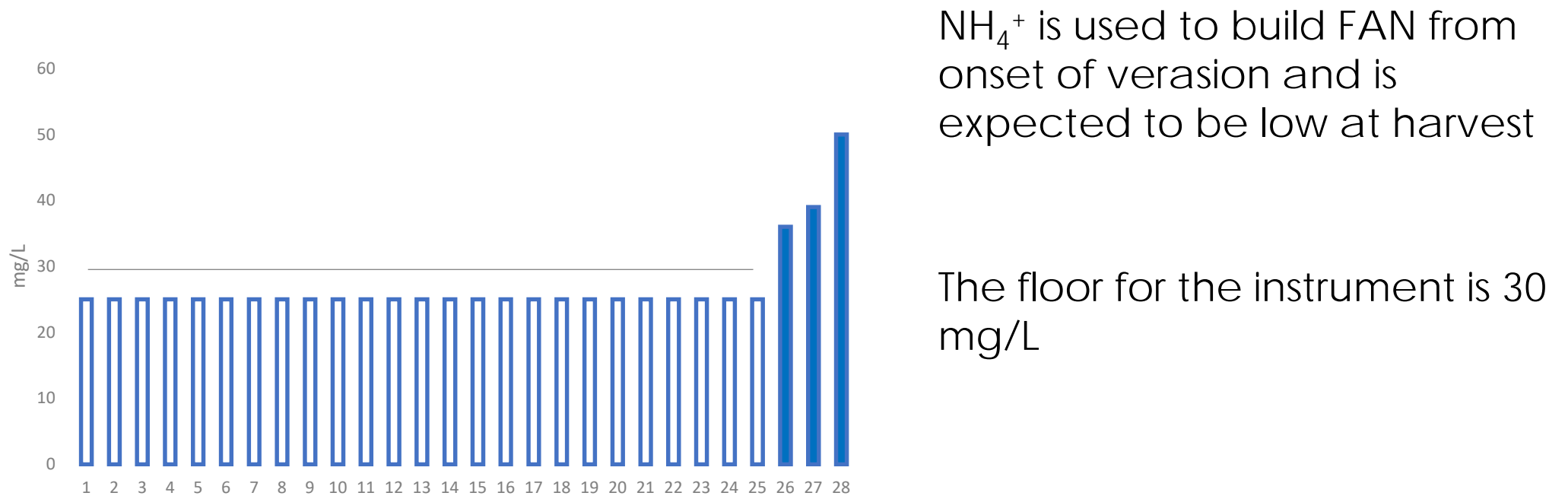
All samples were clarified by centrifugation 6000 rpm for 20 minutes
Turbidity 80 - 100 NTU

YAN IN SOLARIS MUST – ORGANIC YAN



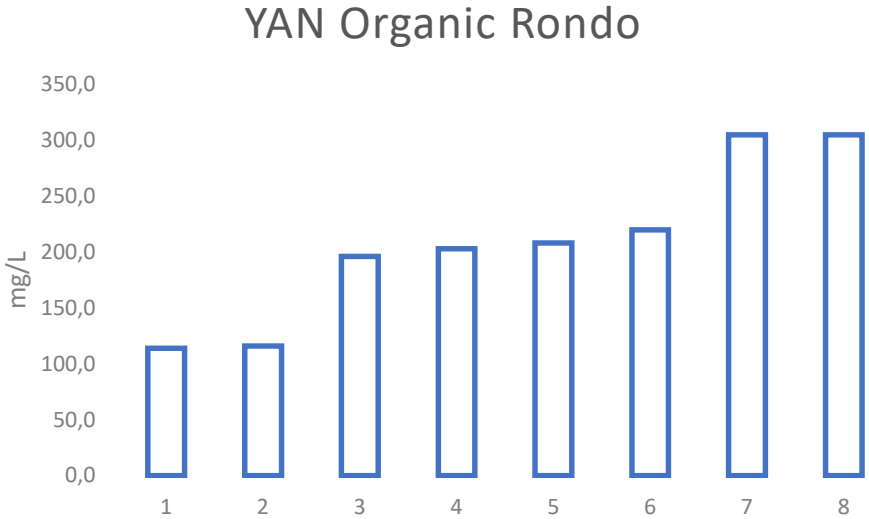
Most musts need supplementary nutrition

YAN IN SOLARIS MUST – INORGANIC YAN

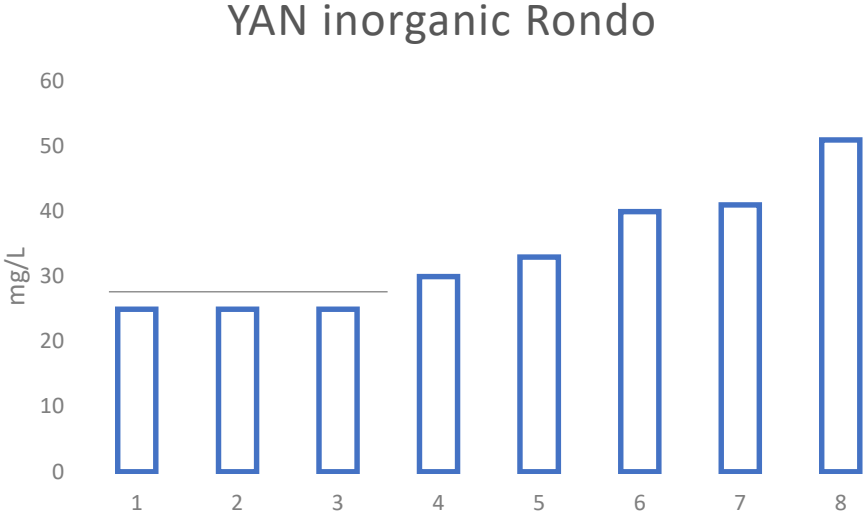


Most musts does not have measurable levels of NH_4^+

BLUE GRAPES USUALLY HAVE HIGHER YAN VALUES

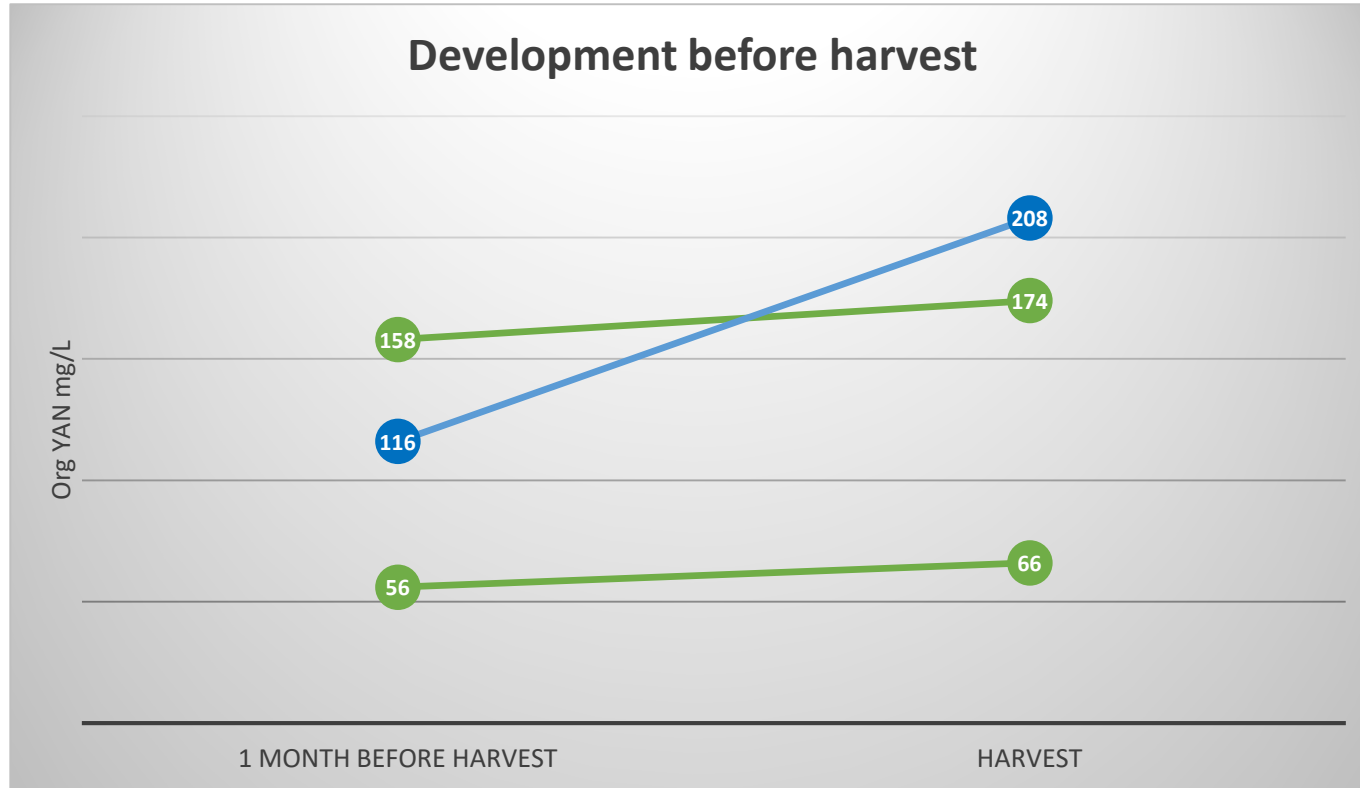


Average Org YAN
Rondo 208 mg/L
Solaris 143 mg/L



More red musts have measurable levels of NH_4^+ in the range of 30 - 50 mg/L

WHAT HAPPENS DURING RIPENING?

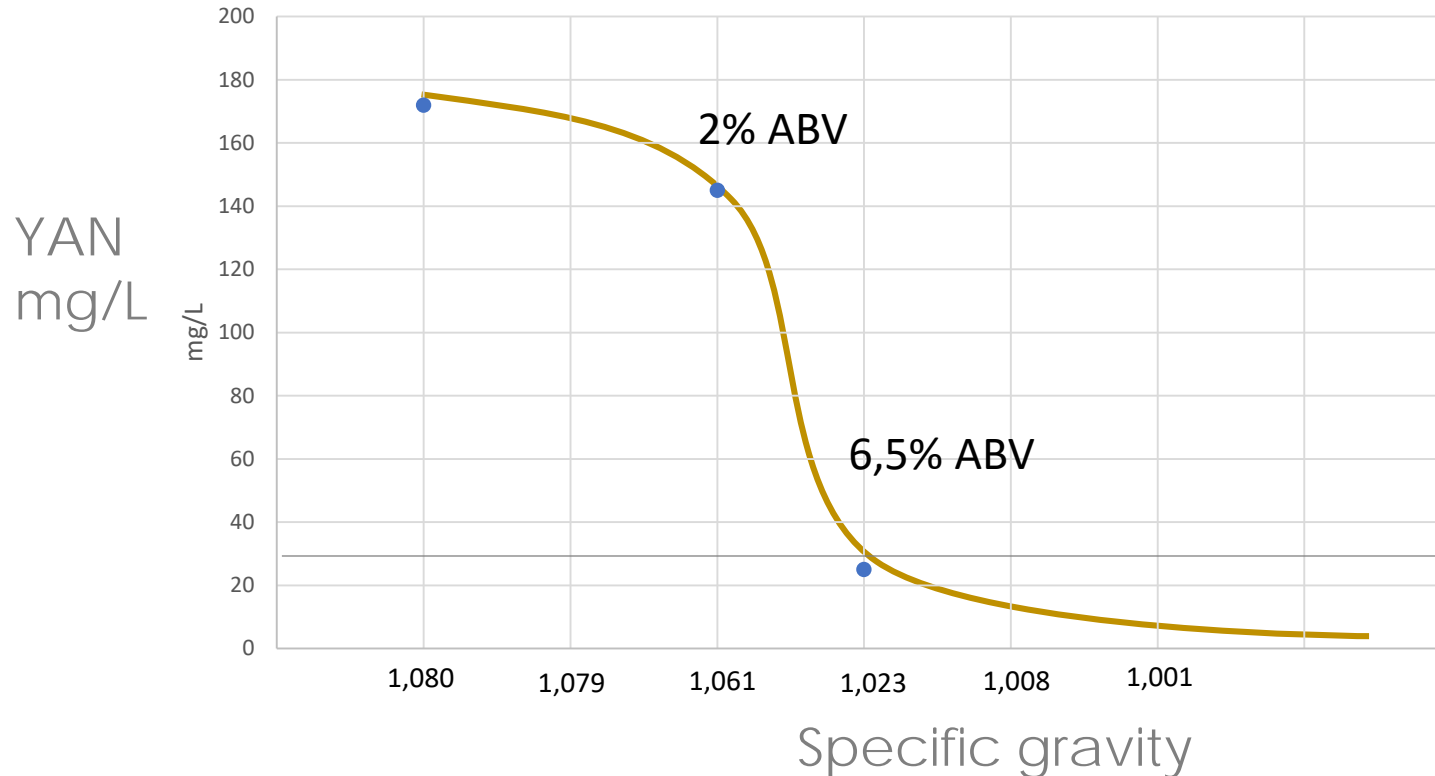


There is an increase that may be significant during the last month

A sample a few days before harvest is considered representative

CASE 1: SOLARIS WITH STARTING VALUE OF 172 MG/L

76 Oe 18,4 brix



Supplemented with 38 mg/L
Total YAN: 210 mg/L

Normal fermentation

Consumption during
fermentation 210 mg/L

Clean aroma in wine

YAN was consumed within 3 days without residual

CONCLUSION

There are now substantial evidence that just about correct level of YAN improves aroma of wine

YAN level in must vary considerable

With measurement of YAN in must the winemaker can make an informed decision of how much nutrition to add

Don't take a chance on the right YAN level