Olive Oil Chemistry for Non-Chemists (By a Non-Chemist)

David Garci-Aguirre Corto Olive Co. COOC Annual Meeting 3/6/2019



A QUICK O V E R V I E W

- The Extra Virgin Standard applies at the end, not at the beginning
- Testing at Milling vs. Testing over Time
- The Fresh Fruit, Fresh Oil Framework













Freshness of Oil



Freshness of Fruit (Health at Milling)	Freshness of Oil (Health Over Time)	
FFA		
PV		
Moisture, Impurities		
	K232	
	K270	
	Delta K	
	PPP	
1,2 DAG's	1,2 DAG's	



<u>Fermentation</u> of Fruit

Oxidation of Oil







Fermentations cause a Free Fatty Acid to "break free"



FFA Remains Fairly Flat Over Time



Target: <.3% Free Fatty Acids

Olive Oil Chemistry for Non-Chemists

DAG = Diglyceride (2 fatty acids). Fresh, High quality oils have high levels of 1,2 DAG's compared to 1,3 DAG's





Target: at least 90% 1,2 DAG's vs 1,3 DAG's



Measures the Potential for Oxidation



PV Target: < 5

Olive Oil Chemistry for Non-Chemists

Fresh Fruit, Fresh Oil



Parameter	Extra Virgin	Target at Milling	
FFA	≤ .5 < . 3		
PV	≤ 15	< 5	
Moisture	≤ .20	< .20	
K232	< 2.40	< 1.8	
K270	< 0.22	< .12	
РРР	< 17	< 2%	
DAG'S	≥ 35%	> 90%	



Oils made properly with Fresh fruit have:

- Low FFA
- High 1,2 DAG's
- Low PV
- Low Moisture

Oxidation of Oil





K232 History



1,2 DAG's want to be 1,3 Dag's and change over time.



1,2 DAG's and PPP's change predictably across all varieties over time.

1,2 DAGS: ↓ 20% Every YearPPP:↑ 7% Every Year



Olive Oil Chemistry for Non-Chemists

Temperature has a profound impact on DAG's and PPP's



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K232	< 2.40	< 1.8	
K270	< 0.22	< .12	
PPP	< 17	< 2%	
DAG'S	≥ 35%	> 90%	



Fresh Oils have:

- Low UV
- High 1,2 DAG's
- Low PPP

In Good Conditions:

- 1,2 DAG's decrease 20% per year
- PPP's increase 7% per year

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FFA	≤ .5	<.3	
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K232	< 2.40	< 1.8	
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What's Next?

- Predicting Shelf Life
- Cheaper Testing
- Better. Fresher. Oil in the Market Place



Olive Oil	Chemistry	for N	on-Ch	nemists
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Special Thanks to:

Modern Olives UC Davis Olive Center AgBio Lab Eurofins

Useful Links: Olive Oil Commission Of CA - Shelf Life of Olive Oil

Thank You

