



High Oleic Peanut Chemistry & Finished Product Quality

APRES Post Harvest Quality Symposium

Francis Marion Hotel – Charleston, SC

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Pre-HOAP Commercialization (1997)

- Peanuts & other nut meats limit the stability of confectionery & snack products
 - Shelf life as short as 3-4 months
- Other products have packaging & processing options
 - Jarred butters – barrier package, de-aeration & vacuum packing
 - Nitrogen flushing
 - Antioxidants



In confectionery products...

- Vacuum packing will work experimentally, but...
 - Packaging films are expensive.
 - Line speeds for vacuum packaging limit production.
 - Antioxidants are effective in butter applications but not in whole, split or chopped nuts.
 - Synthetic antioxidants are falling out of favor as a result of consumer demand for clean ingredient labels.

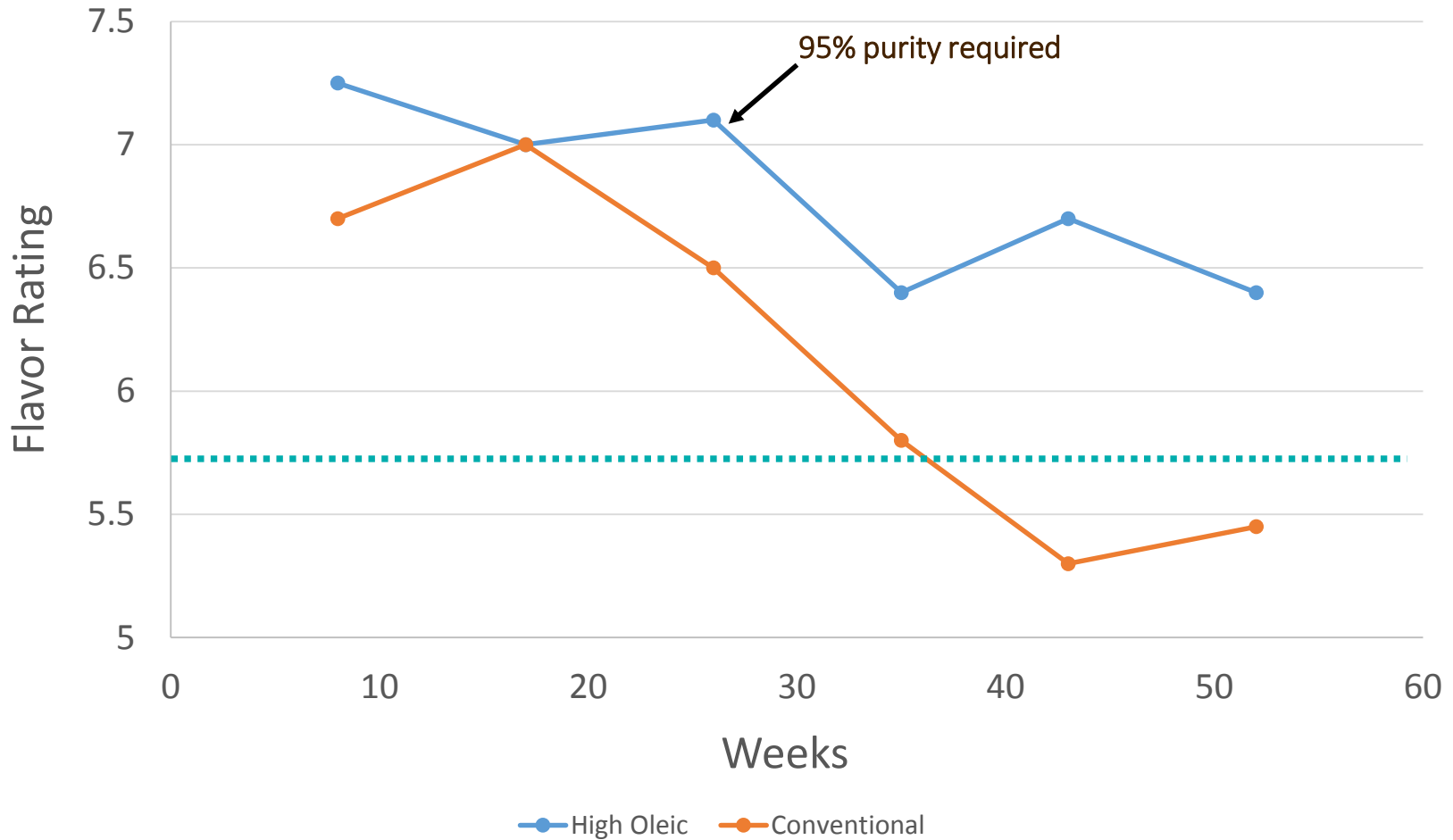


High oleic acid peanuts provide the perfect solution for maintaining product freshness and stability in addition to achieving a clean label.



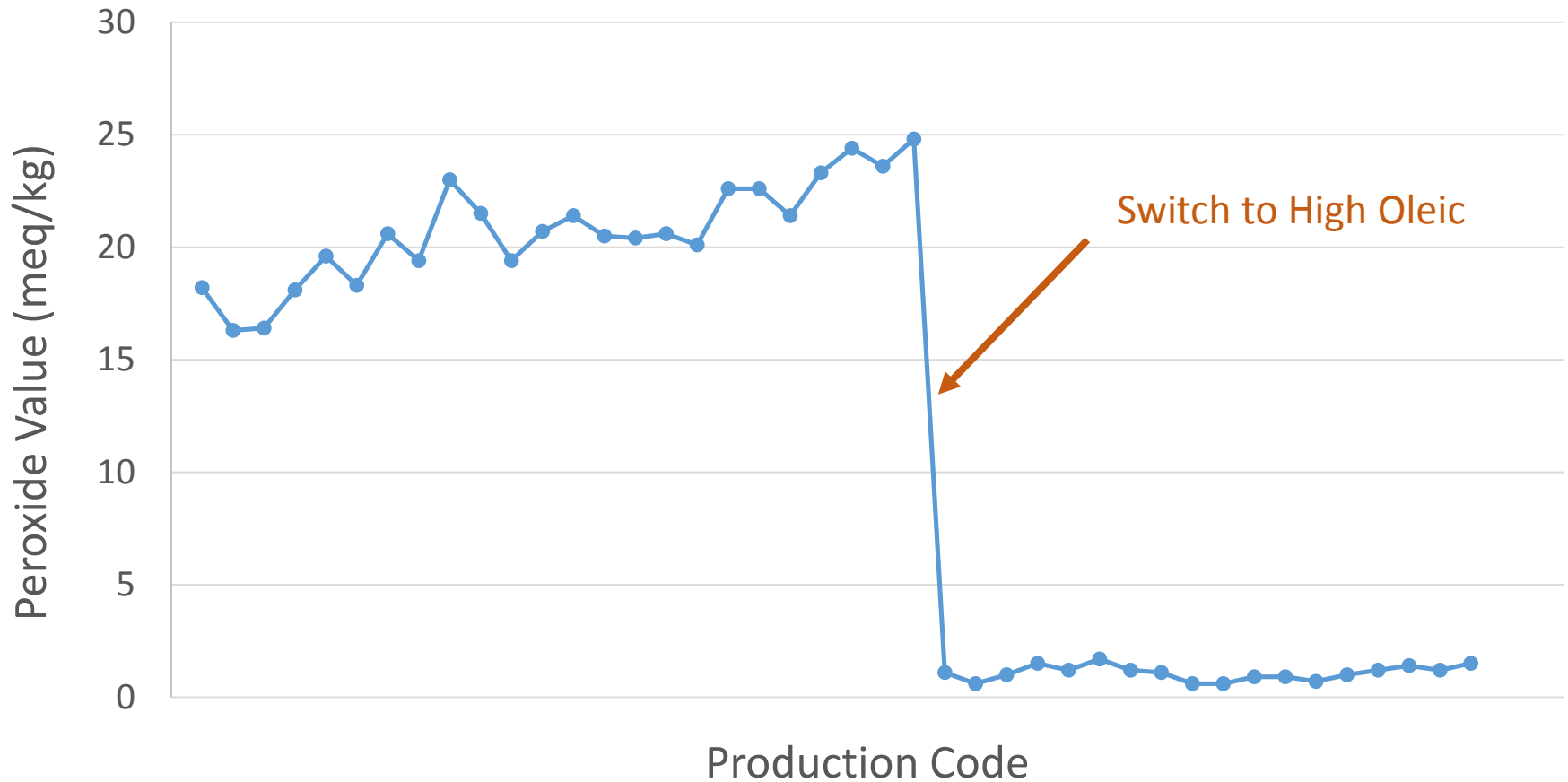
Oil Composition Impacts Flavor over Shelf Life:

Product Shelf Life Performance



6-Week Old Mr. Goodbar Stability

Mr. Goodbar Production Performance



Purity is as important as Bulk O/L

Peanut kernels were spray painted black to represent contamination from non-HO off-types



Specification
Bulk O/L: ≥ 11.0
 $\geq 95\%$ Purity

Bulk O/L: 13.8
83% Purity

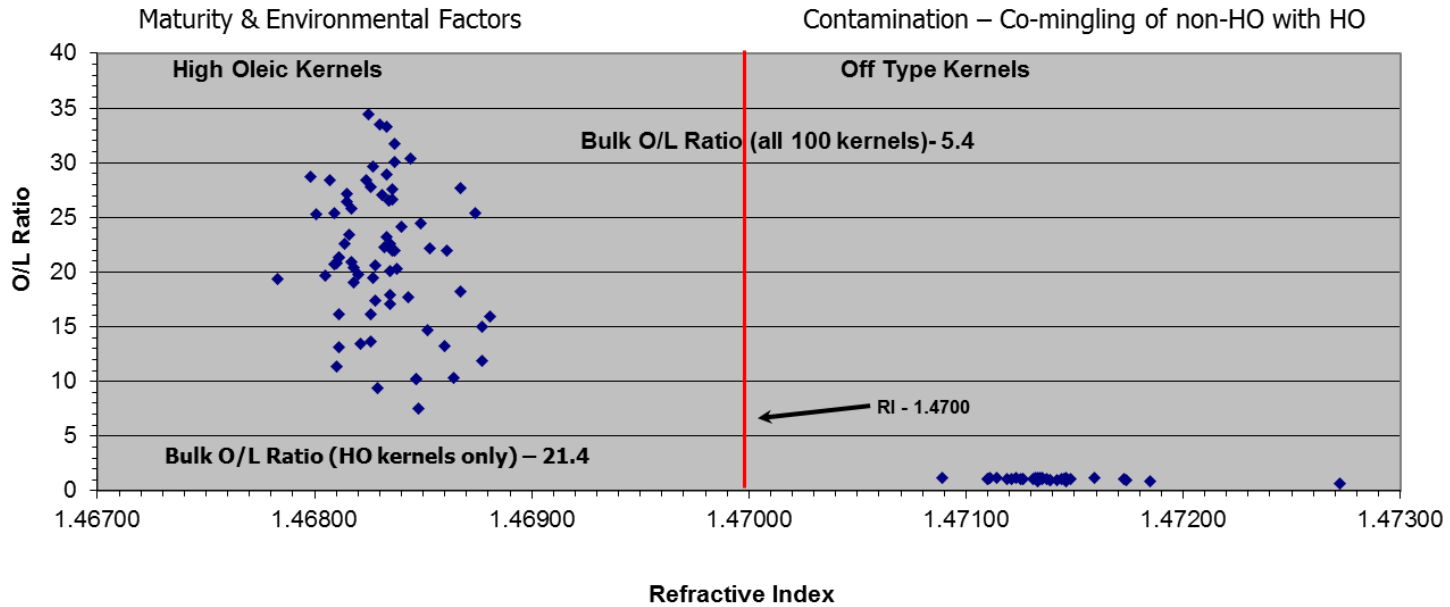
Bulk O/L: 13.9
64% Purity

Bulk O/L: 3.1
37% Purity



High Oleic Purity and Single Kernel Maturity Impact High Oleic Oil Quality and Product Performance

OL- 06 Certified Seed Refractive Index vs. O/L Ratio 68% Purity



Pure Peanut Lines are Needed

- 2010 assessment of AT-9899 yielded 13.3% contamination.
- Low purity was related to contamination and can be controlled through avoidance of mechanical mixing of seeds.
- Purification in 2011 and subsequent control yielded a 99% purity of AT-9899 with 2013 Crop.
- Peanut Seed Certification Standards:

Factor	Certified Seed
Pure Seed (Min.)	95%
Other Varieties (Max.)	0.5%



Analytical Methods for Measuring Purity

Method	Pros	Cons
GC (Standard)	<ul style="list-style-type: none"> Extremely accurate 	<ul style="list-style-type: none"> Time consuming - 2 days Expensive - \$580/100 kernels Destructive
Refractometer w/ Temp Control	<ul style="list-style-type: none"> Good correlation with GC Fast – 3 hrs/100 kernels Less expensive than GC (\$150/100 kernels) 	<ul style="list-style-type: none"> Destructive
NIR/Seedmeister	<ul style="list-style-type: none"> Extremely rapid Low cost except for initial capital expense for instrument Non-destructive 	<ul style="list-style-type: none"> Calibration of instrument requires chemometrics software expertise Variability between instruments widely reported



Adoption of High Oleic Technology:

- Goal to incorporate trait into all new varieties
- Hershey uses high oleic peanuts in major brands

