

Refrigeration is not reliable in detecting olive oil adulteration

March 2013

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A recent episode of The Dr. Oz Show (2/11/13) prompted many consumers to ask the UC Davis Olive Center whether refrigerating olive oil is effective in detecting adulteration. Based upon our analysis, we find that the “fridge” test is unreliable in detecting either purity or quality.

While cautioning that his method is not 100 percent foolproof, Dr. Oz had encouraged viewers to evaluate the purity of extra virgin olive oil by putting it in the refrigerator. He said that if the oil “freezes” (solidifies), the viewer could be “pretty sure it is pure.” Many viewers who tried the test complained to olive oil producers and retailers when the oil failed to solidify.

It is true that waxes and long-chain fatty acids in extra virgin olive oil can lead to the oil solidifying in the cold, although relative amounts of these compounds vary from oil to oil. To evaluate the “fridge” method, we placed seven oil samples of various composition in a laboratory refrigerator with the temperature set to 4.7°C (40.5°F). We checked the samples periodically to see if there was any change.

THE SAMPLES

1. Extra virgin olive oil, high quality
2. Extra virgin olive oil, low quality
3. Olive oil, a blend of virgin and refined grades
4. Canola oil, refined
5. Safflower oil, refined
6. Samples #1 and #3 (50/50 blend)
7. Samples #3 and #4 (50/50 blend)

None of the samples showed any sign of congealing after 60 hours. After 120 hours (five days) the samples that contained at least 50 percent virgin olive oil (1, 2, and 6) showed minor congealing at the bottom of the bottles, an effect that became more obvious at 180 hours, but the samples never fully solidified. The other samples, which were mostly refined oils, remained liquid.

Thus, the “fridge test” is unreliable in judging whether an olive oil is truly made from olives, nor does it provide information on the quality of the oil. Sensory and chemistry testing is essential to determining olive oil authenticity and quality. Consumers can increase their chances of getting quality extra virgin by choosing an oil within 15 months of the harvest date (not the best before date), looking for a certification seal indicating that the oil passed chemical and sensory testing, and seeking oils that are protected from light.



0 hour



60 hours - No change



120 hours - Some congealing in 1, 2 & 6



180 hours - More congealing but not complete solidification in 1, 2, & 6, the only samples with > 50% virgin olive oil