# *Olive Oil Commission of California*
## Use By Technical Evidence Guidance Document

***Why require use by?***

To be compliant with FDA recommendations issued over the last 3 years, the Olive Oil Commission decided to mandate use by dating on olive oils for transparency and clarity to consumers. The FDA has recommended industry groups take this approach as they are not able to mandate use by dates for all product, currently only for baby food and juice. This initiative originated with the food waste reduction by consumers.

***Why require technical evidence?***

There is substantial research done across the world on olive oil shelf life stability to correlate and determine what are the key parameters of degradation to test and qualify when an oil has gone from Extra Virgin to Virgin or Crude. Coupling this research with internal testing is vital for a business to validate their own use by. The focus of the evaluation being- the oil must meet the Extra Virgin Grade as stated in the Quality Parameters as stated in Table 1 of the OOCC Grades and Labeling Standard. Some examples for technical evidence are:

- Best By Calculator or prediction models *Guidance*
- Assessing the key quality parameters with review of other research *Below*
- Use By Trial *Below*

***What does the Commission Expect of Handlers?***

The intention of the recommendations below is to ensure handlers have on file reports validating their use by dates printed on bottles. For some bottlers and handlers, it would be cost prohibitive to conduct a full trial and testing. An alternative recommendation to trial set-up is to have a report on file annually to evaluate the olive oil quality chemistry and relate to the various shelf life prediction models available. If using this method, this report is recommended to be done annually, to update the new harvest chemistry results evaluation.

***Examples of Technical Evidence:* Technical Evidence Report Summary**

**Assessing Key Quality Parameters Report**

The recommended topics to cover in your report would be:

- Controlling Measures
    - Detail section about how you control the product quality of the oil in your possession. Below outline some recommended topics to cover here in how you control your quality, to include in your report as a summary- proving the steps you are taking to ensure longevity of the oil.
    - What storage conditions do you use, i.e.:
        - temperature controlled at what temperature range?
        - Use stainless steel vessels only?
        - Nitrogen flush/blanket the oil regularly to maintain quality?
        - Bottle as needed vs. bottling all right after harvest?
        - Filter or not filter the oil to improve sediment integrity?
        - Rack oil prior to final storage and/or bottling?

- Data Analysis
    - Summary of harvest chemistry and sensory of each lot of oil including but not limited to- FFA, PV, UV's, PPP, and DAG, induction time, total phenol, sensory. Testing results should be no later than 1-month post-harvest of the oil for best results.
    - Using one of the models reviewed by the *UC Davis Olive Center* in the **Shelf Life of Olive Oil and Useful Methods for its Prediction** use your data to show the potential trend of degradation and what shelf life the model suggests the oil will last under optimal conditions
- Conclusion
    - Summary based on the facts of your controlling storage to maintain oil quality, along with the results of your oil based on the prediction models what shelf life your oil will maintain.
    - Include here any findings you found in the data that you can do to improve on the next year's harvest to improve your quality.

**Use by Trial Set Up**

A shelf life trial is recommended to be conducted every few years on your product to evaluate the oil quality over time with the use by date you provide is enough to maintain the quality of the oil as labeled.

A use by/ shelf life trial for olive oil is not the same as most other foods. Instead of looking for bacterial or fungal growth and other food safety concerns, an olive oil use by trial is set up to evaluate strictly the quality of the oil and degradation of the oil grade to the next level. This is to maintain if the oil is labeled as extra virgin the oil remains extra virgin to the stated use by date on the label.

- Considerations for use by trials:
    - Done under ideal storage conditions as it is difficult to predict how the stores will manage the product and could become costly in testing.
    - Once a container is opened and tested it should not be-reclosed and re-used at a later month testing. i.e. multiple containers will need to be needed to conduct trial
    - Always plan for a test or two post your use by date to test past date quality and what happens to the oil.
    - As close as possible use containers and oil that were manufactured in the way that you manufacture to sell. Example- don't hand fill bottles and cap, if you have a line that fills the bottles, pull the bottles off your line at a production date.

- Setting up a trial and Conducting:
    - Decide on which oil (s) and container (s) you want to test. Save at minimum 2 bottles per each testing frequency
    - It is recommended to test every other month or 1x quarterly for the extend of the use by of the product + 2 additional after the use by date. If your product has 24 months shelf life you should test up to 28 months (at quarterly would be 9 testing times, at every other month would be 13).

- Decide on which chemical and sensory parameters to test and a lab to send samples to. It is important to keep the lab consistent on the testing for the extent of the trial. *See OOCC recommended labs on the OOCC website*
  - The chemical parameters at a minimum that should be included: FFA, PV, UV's, Total Phenol, Induction Time, PPP, DAG, Sensory.
  - Phenol and Induction time are not required OOCC Quality Standard testing, however highly recommended in evaluating a use by date for your oil.
- Collect the samples to be stored and tested. Store the samples in a controlled location.
- At your set frequency of testing, pull 1 bottle at minimum to test. Send the samples out to testing and obtain results. *It is recommended to do a blend of 2-3 bottles for each but could be cost prohibitive.*
- At each testing frequency record the data and evaluate the trend of each parameter- showing how the parameters tested are changing over time.
- Upon time that your samples fail the OOCC Standard for the grade the oil is labeled, test 2 additional frequencies later at minimum to evaluate how the oil degrades or if there was a anomaly issue sample.
- OOCC Quality Standard Table 1: http://www.oliveoilcommission.org/wp-content/uploads/2018/11/Summary-Tables-of-California-Olive-Oil-Standards-2018-19-1.pdf

- Conclusion
  - After the extent of the use by a final report with findings shall be concluded evaluating the data. The data will clearly show if the oil still meets the OOCC Quality standard at commencement of the trial.
  - Evaluation of the data should include recommendations to take on modifications to extend or reduce the use by date, better storage conditions, or changing the container for improved results.

**Technical Resources for investigating your Use by date**

USDA FSIS- Food Product Dating ; retrieved from https://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/food-labeling/food-product-dating/food-product-dating

FDA- Confused by Date Labels on Packaged Foods? Retrieved from https://www.fda.gov/consumers/consumer-updates/confused-date-labels-packaged-foods

Wang, S. (2014). Packaging Influences on Olive Oil Quality. Retrieved from https://olivecenter.ucdavis.edu/media/files/PackagingInfluencesonOliveOilQuality.pdf

Ayton, J. (2012) The Effect of Storage Conditions on Extra Virgin Olive Oil Quality. Retrieved from https://1.oliveoiltimes.com/library/Olive-Oil-Storage-Conditions.pdf

Wang, S. (2017) Shelf Life of Olive Oil and Useful Methods for its Prediction. Retrieved from http://www.oliveoilcommission.org/wp-content/uploads/2018/03/16-17-OOCC-Lit-Review-Shelf-Life.pdf