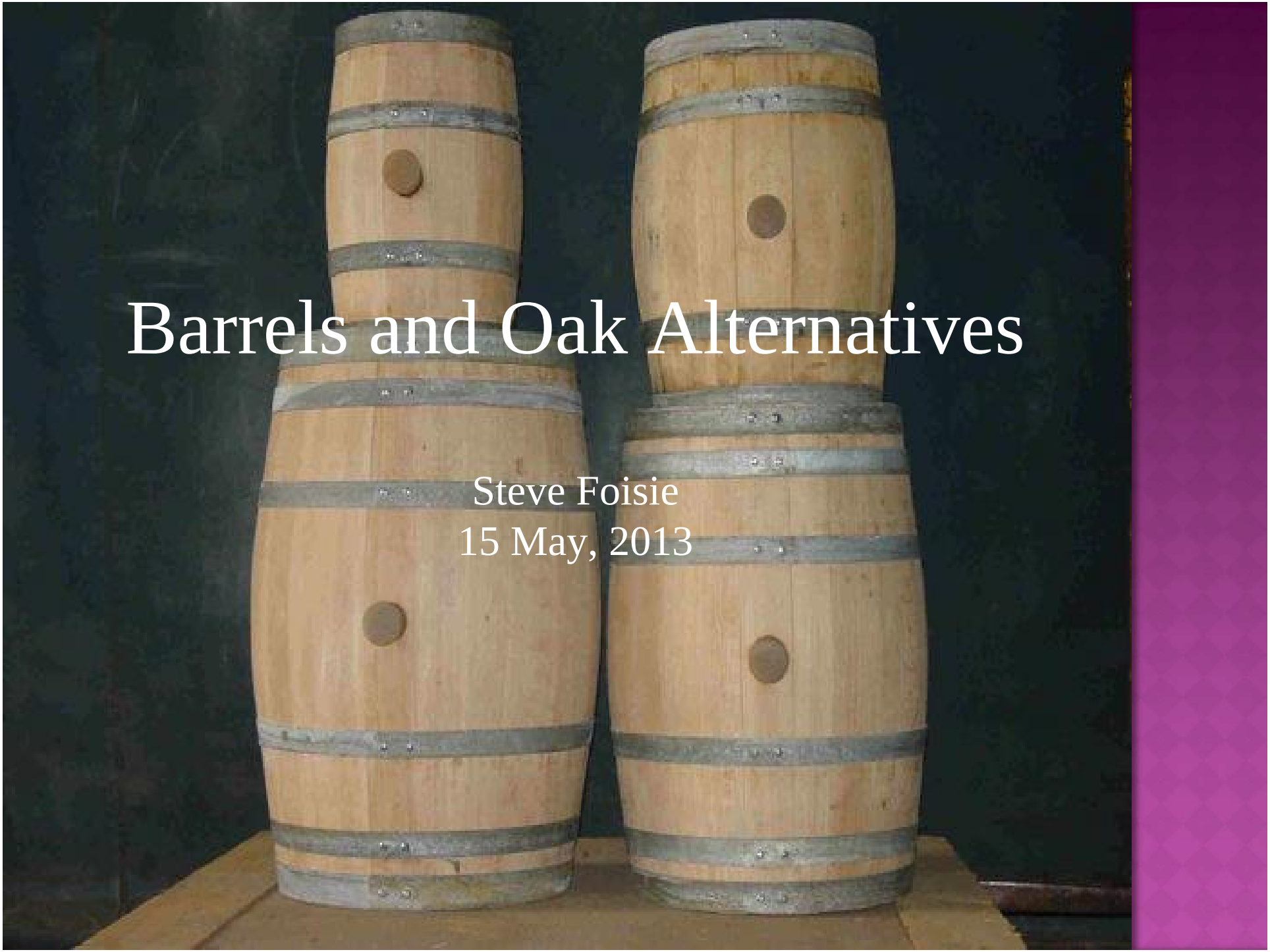

Barrels and Oak Alternatives

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BARRELS AND OAK

- Why?
- History
- Anatomy
- Construction
- Oak alternatives
- Integrating barrels into wine making
- Maintenance
- Buying a barrel

WHY BARREL WINE?

Positive considerations

- Controlled oxidation, evolution of aromas
- Softening of tannins
- Darkening of color
- Stabilization of wine
- Extraction, integration of oak flavors
- Supports ML bacteria

WHY BARREL WINE?

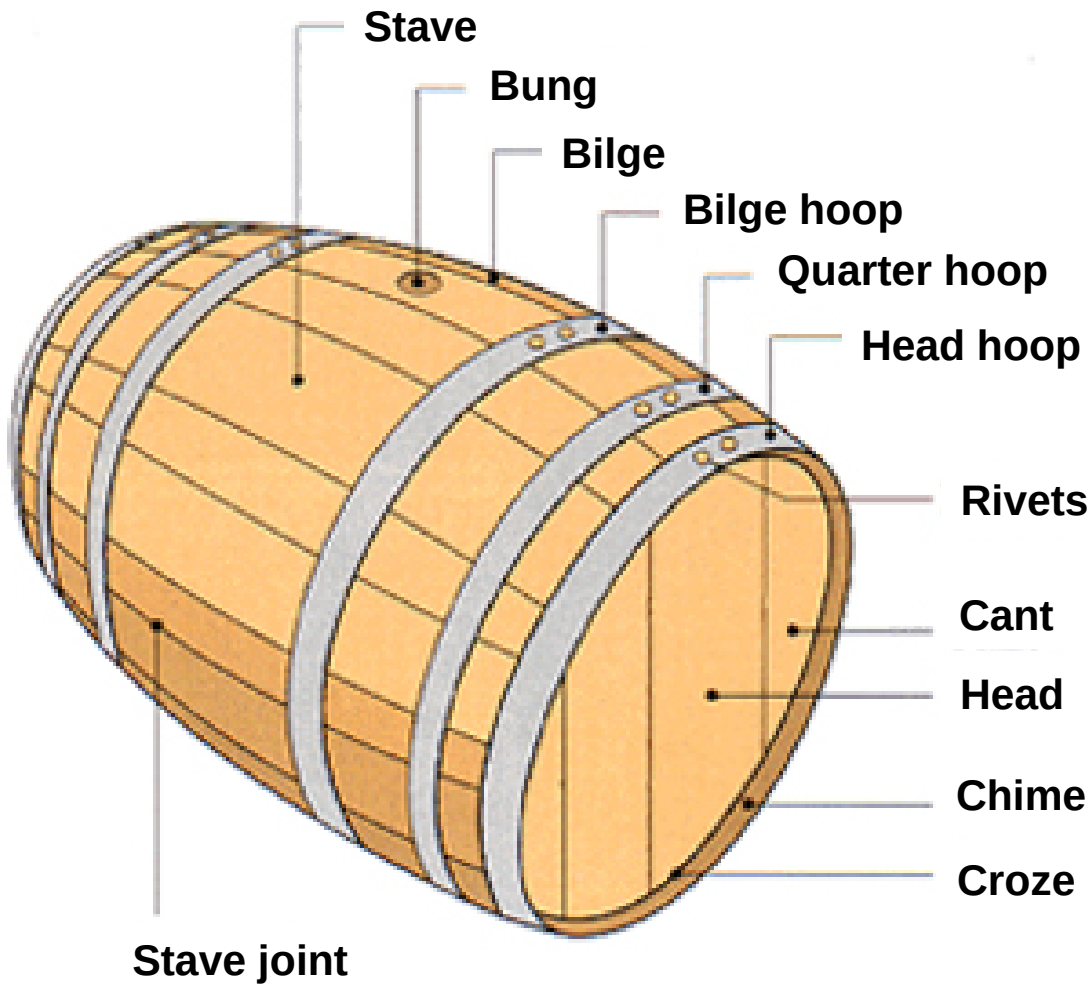
Negative considerations

- Expensive to own
- Expensive to fill
- Prone to spoilage
- Limited useful life
- Heavy and needs proper support
- Opaque. Can’t see the sediment
- Needs regular attention

HISTORY

- Difficult to trace early origins of wood barrels.
- Oak barrels in use for at least 2000 years
- Earlier, clay was preferred, though fragile
- Oak and other species recognized for their ability to be bent with heat.
- Only recently has aging in oak been recognized for more than convenient storage.
- Forest selection and toasting becomes an artform

BARREL ANATOMY

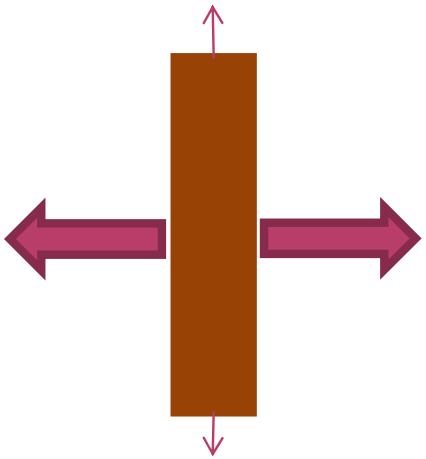


BARREL CONSTRUCTION

Physics of wood

- Wood moves, shrinks, swells with changes in humidity
- Movement unique to each specie
- Expands more side-to-side
- Less lengthwise
- For this reason barrels will swell

tight when filled with water or wine



BARREL BUILDING, AN ART FORM

- It takes skill and experience to source and select the proper tree and efficiently split them.
- It take skill to masterfully construct a barrel to be water-tight
  - Shaping the staves
  - Constructing the head
  - Assembling the barrel
- It takes special skills to know how to consistently toast a barrel to the specifications of the order
- Every cooperage does it differently, a lost of variation between coopers

BARREL CONSTRUCTION

European oak used in wine barrels

- Common oak (Q. robur)
- White oak (Q. petraea)

- Both species are found throughout Europe
- Q. petraea is often preferred in France
  - finer grain
  - richer contribution of aromatic components
- Barrels are also sourced from Hungary, Slovakia Czech, Baltic states

BARREL CONSTRUCTION

American oak used in wine barrels

- White oak (Q. alba)
- Oregon (Q. garryana)

- Q. Alba more intensely flavored than European oaks.
- Can be sawn rather than split (more tannin)
- Used to pair with heavier, more robust, warmer climate reds
- Some chardonnays aged in Q. alba for the sweet, vanilla, coconut contributions.
- Oregon white oak still being evaluated.
- Similar to European species

BARREL CONSTRUCTION

Aging

- Wood from 100+ yo trees is split and stacked
  - Thinner staves (21 mm) promote more rapid exchange of oxygen than thicker staves (25 – 27 mm)
  - The tightness of the wood grain is proportional to extraction: the tighter the grain slower the extraction of the aromatics
  - Cooler climates typically yield tighter grain.
  - Typical barrel options include Bordeaux (225 l) and Burgundy (228 l), export and chateau fere styles and smaller 112 liter sizes.
- Staves are weathered out doors for two or more years before barrel building. Longer aging, more expensive
- More volatile, bitter components leach out by rain

BARREL CONSTRUCTION

Toasting (l, M, M+, H)

- Heat allows the wood to be bent with steam or oak wood fire
- Once the barrel is shaped, it is toasted
- Raw oak imparts a green, bitter flavor, not desirable
- Heat caramelizes the cellular sugars
- De-natures the tannins
- Increases aromatics
- Heavy toast for brandy and whiskey
- Heads almost always toasted
- Toasting is an art form

BARRELS

YouTube Videos of Dirty Jobs:

"Making an oak barrel at Seguin Moreau"

- barrel building part 1
- barrel building part 2
- barrel building part 3

OAK ALTERNATIVES

- Staves, chips, balls, cubes are available in a variety of sizes, toast levels, and species
- The larger the size, the slower the extraction
- The wood serves as a filter for bitter components
  - Smaller chips need to be rinsed with hot water before use
  - Chips and other alternatives are typically used once
- Dosage depends in the surface of the oak are and the quantity of wine (Supplier recommendations)
  - 4 to 8 cups of chips per 225 l barrel
  - One month for full extraction with chips, stir regurlarly
  - Staves and balls may take several months for desired flavor

INTEGRATING A BARREL INTO WINE MAKING

Questions to consider before ordering a barrel

- Do you have the space and means to rack and clean the barrel?
- What size/volume are you considering?
- New or used? (new preferred)
- Will you have enough wine to keep it filled/ topped off?
- What wine will you use for topping off?
- Do you have enough tank volume or carboys to rack into?
- How many subsequent vintages will the barrel be used?
- Will you build a rack or use a pump, or both?
- American or European?

BARREL AGING CONSIDERATIONS

- It is far better to have a plan that keeps wine in the barrel than to leave the barrel empty
- Plan your vintage accordingly.
- The smaller the barrel
  - The more rapid the oxygen exchange,
  - The faster the aging
  - The greater the risk of oxidation
  - The more costly per gallon of volume

BARRELS: IT ALL RELATIVE

Barrel Size	Surface Area (Sq In/Gal)
5	116
10	92
30	64
50	54
100	43

- Smaller format barrels do not allow the wine to age as gracefully
- Larger barrels can be cumbersome, expensive to fill, require more tank volume for racking

OTHER CONSIDERATIONS

- It is often preferred to add racked, sediment-free wine to the barrel (unless barrel fermenting)
  - Reduces future racking
  - Reduces potential off odors from autolysis
- A new barrel can absorb and lose nearly 10 liters of wine per year, depending on humidity and barrel characteristics
- Losses are due to absorption into the wood and evaporation of the wine through the staves
- Have a convenient means to top off the barrel with a suitable, quality wine, ½ - ¾ bottle per month

MAINTENANCE

- New barrels only need to be briefly filled with water to ensure they are sealed.
- Three to four times a year rack the wine and rinse the barrel of sediment.
- Keep the bung area sanitized to prevent infection.
- Keep a proper amount of sulfite in the wine to prevent spoilage of wine and barrel
- Top off the barrel on a regular basis during first year to prevent over-oxidation
- Between vintages, rinse with hot water to remove bi-tartrate crystals. Add oak chips as necessary

MAINTENANCE

If it is necessary to leave the barrel empty:

- Rinse it thoroughly with hot water to remove bi-tartrate
- For storing one to three months, fill with sulfite and citric acid solution (500 ppm)
- For longer periods, rinse with sulfite solution, and drain dry, bung down, and sealed with a Dixie cup
- Restore with hot water and per-carbonate wash. Rinse with citric acid.
- Very hot water or steam clean if necessary
- A spoiled barrel is fire wood or a planter

BUYING A BARREL

Steve's Recommendations

- Buy new and order from a cooperage
- Order the largest size you are comfortable with
- 15 gallon barrel absolute smallest, 30 gallons better
- American or Hungarian oak
- Two to three years air dried, three is better
- Medium + toast level, toasted heads
- Tight grain, slow extraction
- Have at least two silicone bungs, one for venting and one for sealing

FINAL THOUGHTS

- Have a plan which should include keeping the barrel full of wine throughout its useful life.
- Keep everything sanitary and clean.
- Never have chlorine anywhere near the cellar
- Remember: wine will soften in a barrel but will also lose fruit.
- Resist over aging in a barrel, Know when to bottle.
- Some wine varieties do not benefit from any amount of oak or long barrel aging
- **Oak flavor is not fruit**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