THE THELEN RESERVE

BOURBON: GRAIN TO GLASS

PART 1 OF 2 • GRAIN TO SPIRIT

Follow the transformation from a grain recipe to clear new-make spirit.

01 • Choose the grain recipe [1,2]



AT LEAST 51% CORN

Legal minimum, not a universal recipe.

What happens	Why it matters	What changes
The mash bill sets the proportions of corn, rye or wheat, malted barley, and any other grains.	The recipe establishes the starting character; yeast, distillation, and barrels shape it further.	Separate grains become a measured recipe.

02 • Mill the grain [3]



What happens	Why it matters	What changes
A mill breaks the grains into meal.	Milling exposes starch and helps water and enzymes reach it.	Whole kernels → smaller particles.

03 • Cook and mash [2,3]



What happens	Why it matters	What changes
Water and heat make starch accessible. Enzymes from malt or added preparations break it into fermentable sugars.	Yeast needs usable sugar; it cannot directly ferment intact grain starch.	Starch-rich meal → sugar-rich mash.

04 • Cool and ferment [2]





SUGARS → ALCOHOL + CO_2 + AROMA COMPOUNDS

What happens	Why it matters	What changes
The mash is cooled and yeast is added. Yeast consumes sugars, producing ethanol, carbon dioxide, and aroma compounds.	Yeast strain and fermentation conditions influence fruit, floral notes, and other flavors.	Sugar-rich mash → alcoholic distiller's beer.

05 • Distill and shape the spirit [1,3]



160 PROOF
80% ABV MAXIMUM

Bourbon distillation limit.

Pot-still and other commercial setups also exist.

What happens	Why it matters	What changes
Heating creates vapor richer in alcohol; cooling condenses it. Many producers use a column still followed by a doubler or thumper.	Equipment, copper contact, and spirit selection influence which aroma compounds carry forward.	Distiller's beer → concentrated spirit.

06 • Collect the new make [2,3]



Often called white dog.

What happens	Why it matters	What changes
The selected clear spirit is collected and checked before barrel entry.	Its character becomes the foundation for maturation.	Clear new make is ready for oak; amber color develops during barrel aging.

THE SOUR-MASH LOOP [4]

Many distilleries return backset, the liquid from a previous distillation, to a new mash. It helps manage acidity, nutrients, and consistency.

Fresh yeast still drives fermentation. Sour mash does not mean sour-tasting bourbon.



THE TRANSFORMATION

WHOLE GRAIN → MEAL → SUGARY MASH → DISTILLER'S BEER → CLEAR SPIRIT

Continue to Part 2: Barrel to Glass.

SELECTED REFERENCES

[1] 27 CFR §5.143. [2] Kelly et al., *Beverages* (2023), 9:64, doi:10.3390/beverages9030064.

[3] AIChE, *The Chemistry of Bourbon* (2021). [4] *The Oxford Companion to Spirits & Cocktails: Sour mash.*

THE THELEN RESERVE

Understand the craft. Follow the transformation.

Production practices vary by distillery.