American-style corn and grain whiskey

Recipe No. 22 — for about 25 l of wort intended for fermentation and subsequent distillation.

We use ALCOMAT American Whiskey Distillers Yeast, alpha-amylase and glucoamylase. The first liquefies the mash; the second helps produce fermentable sugars. The recipe is inspired by the style; it does not justify using the names bourbon or Scotch Whisky.

What are we aiming for?

A grain spirit for ageing with oak. Wort volume 25 l, original gravity 1.055–1.065. Strength after fermentation about 7–9%; fermentation usually takes 3–7 days. Finished drink, for example, 40–46%. Yield depends on wort strength, equipment and fraction separation.

Ingredients

• 4.5 kg of pre-gelatinised flaked maize for mashing, 1.5 kg of milled wheat and 1 kg of pale barley malt.

• About 32–36 l of water in total, including about 24 l for mashing.

• A whole 10 g sachet of ALCOMAT American Whiskey Distillers Yeast.

• ALCOMAT Alpha Amylase: 5 ml per 25–30 l of mash containing up to 10 kg of grain.

• ALCOMAT Gluco Amylase: 5 ml per 25–30 l of mash containing up to 10 kg of grain.

• CIAC if pH needs lowering.

• Oak intended for contact with alcohol and water for dilution.

Enzyme doses refer to mash volume when added, not just the later wort. Do not add sugar or ALCOMAT Nutri-Duo. Choose any nutrient treatment for grain wort and follow the instructions of the appropriate product.

Do not use breakfast cereals with additives. Raw maize needs separate gelatinisation.

Equipment

• A 40–50 l kettle.

• A grain mill, stirrer and lautering equipment.

• A thermometer, pH meter and equipment to measure enzymes.

• A 35 l fermenter with an airlock.

• A hydrometer with test cylinder, siphon tube and cleaning and sanitising product.

• Suitable distillation equipment, an alcoholmeter and separate vessels for fractions.

• A suitable barrel or glass vessel with oak.

1. Prepare the grain

Choose ingredients free from mould and foreign odours. Mill the grain without grinding it into very fine flour. Clean the equipment and sanitise parts that contact cooled wort and yeast.

Check that the flaked maize is pre-gelatinised and intended for mashing.

2. Prepare the mash

Heat about 24 l of water to 60 °C. Gradually add grain, stirring constantly and breaking up lumps. Measure the mixture volume — it should be about 25–30 l.

Measure pH in a cooled sample. For alpha-amylase, adjust to pH 5.5–5.8. Add CIAC in small portions only if pH needs lowering. Citric acid does not raise pH.

3. Liquefy the mash

Heat with regular stirring to prevent scorching. At 83–85 °C, add ALCOMAT Alpha Amylase: 5 ml for 25–30 l of mash containing 7 kg of grain. Maintain 83–85 °C for about 60 minutes. Monitor pH and temperature. High temperature limits the activity of the malt's natural enzymes.

4. Convert starch to sugar

Cool to 60–65 °C. Check pH in a cooled sample; the target for glucoamylase is 4.0–5.0. Add any citric acid gradually. Add ALCOMAT Gluco Amylase: 5 ml per 25–30 l of mash. Stir and maintain 60–65 °C for about 30 minutes. Do not add glucoamylase at 85 °C.

5. Separate the wort

Separate liquid from spent grain. Sparge gradually with water at 70–75 °C to obtain about 25 l of wort. Do not force fine solids through the filter or over-sparge.

Cool a sample and measure gravity. Target 1.055–1.065. If too high, adjust with water; if low, do not automatically add sugar. Record volume and gravity, then promptly cool the whole batch.

6. Add yeast

Bring the wort to 24–28 °C. Rehydrate the whole 10 g sachet of ALCOMAT American Whiskey Distillers Yeast according to the label in about 100 ml of water at 25–35 °C for 20 minutes. Add about 200 ml of wort, mix and leave for about 10 minutes. The temperature difference before pitching should not exceed about 5 °C. Add to the fermenter, mix and close with an airlock, leaving room for foam.

7. Ferment

Maintain 24–28 °C, measuring the liquid. Allow gas to escape. Fermentation usually takes 3–7 days, sometimes longer. Take three gravity readings at intervals of 1–2 days using degassed samples at the appropriate temperature. The result must be stable and indicate attenuation. Do not automatically require a reading below 1.000. A high reading may indicate stalled fermentation or incomplete starch conversion.

8. Prepare for distillation

Let coarse sediment settle and rack the liquid, minimising grain particles and yeast. Do not add PIRO or fermentation inhibitors. Do not age the wort for months like wine.

Distil in accordance with the law at the production location and the equipment instructions. Vapour paths must remain clear and cooling must work correctly. Do not use an open flame near alcohol or a sealed system.

9. Distillation and fractions

A pot still may be used for two runs: the first to obtain low wines, the second for more precise fraction separation. Choose filling level, permitted charge strength, heating and cooling according to the equipment instructions.

Collect successive fractions in separate vessels, recording order, volume and strength. Select the middle fraction for ageing; keep the others separate.

Do not define cuts solely by one temperature or a universal number of millilitres. Smell and taste do not confirm chemical safety. Carry out your first distillation under the supervision of someone with practical experience.

10. Ageing and bottling

Use a suitable barrel or oak intended for alcohol. Choose strength according to method and product; 55–60% may be considered for a suitable barrel, but this is not universal.

Use chips and cubes according to their instructions, checking samples regularly. A small barrel or excess wood can quickly impart bitterness. Do not use wood of unknown origin or varnished wood.

After ageing, dilute gradually with suitable water, for example to 40–46%. After mixing and temperature equilibration, measure strength with an alcoholmeter. Leave for a few weeks and bottle in glass.

How can you estimate alcohol content?

For fermented wort: (original gravity − final gravity) × 131, for example (1.060 − 1.000) × 131 ≈ 7.9%. This applies to wort without later additions of sugar or water. Measure distilled spirit with an alcoholmeter at its calibration temperature.

Frequently asked questions

Is this bourbon or Scotch Whisky? No. Ingredients alone do not meet all the requirements for these names.

Do I use the whole sachet? Yes, 10 g of the specified yeast. Enzymes are dosed separately for the mash.

Do we add sugar or ALCOMAT Nutri-Duo? This version does not call for them. Sugars come from grain.

Do I add both enzymes together? No. They have different stages, temperatures and optimum pH ranges.

Can glucoamylase be added at 85 °C? No. Add it at 60–65 °C.

Does CIAC raise pH? No. It only lowers it.

Is enzyme dosage based on final wort? Use mash volume and grain quantity at the time of addition.

Does a stable high reading mean fermentation has finished? Not always. Check starch conversion and possible stalled fermentation.

Can I determine all cuts by temperature? No. They depend on the charge and equipment.

Does discarding the first millilitres guarantee safety? There is no universal quantity that provides such a guarantee.

Can an alcoholmeter measure wort strength? Not directly. Extract interferes with the reading; it is intended for suitable alcohol–water mixtures.

Can chips replace years of ageing? No. Wood extraction does not reproduce the entire barrel-ageing process.

Mould has appeared on the wort. What should I do? Do not taste or distil it — discard the batch.

Can I use breakfast cereal? No. Flakes for mashing without additives are required.

Is raw maize a substitute? It needs separate gelatinisation and revised instructions.

Can I replace wheat with rye? Separate adjustment is needed; it changes flavour and viscosity.

What affects flavour most? Grain quality, pH and temperature control, fermentation, fraction separation and ageing. Record ingredients, volumes and measurements. Working with grain can become a rewarding hobby based on knowledge, precision and patience.