

Scotch Whisky (Uisge Beatha)

Learning Resources





MALT WHISKY

- There are 5 main types of Malt Whisky dependant on the location of the distillery.
 - **Highland**
 - Produced north of a line from Greenock to Dundee.
 - More individual whiskies come from the islands, particularly from Orkney, Jura, Skye, Arran and Mull.
 - **Speyside**
 - Finest area of production on the river Spey.
 - Unique because of its neutral ph water
 - Soft rounded flavours
 - **Campbeltown**
 - 3 distilleries operational on the Mull of Kintyre.



MALT WHISKY

Islay

- Most full flavoured and peaty malts with iodene and tar flavours.

Lowland

- South of Greenock / Dundee line the lightest of malts largely used in blends



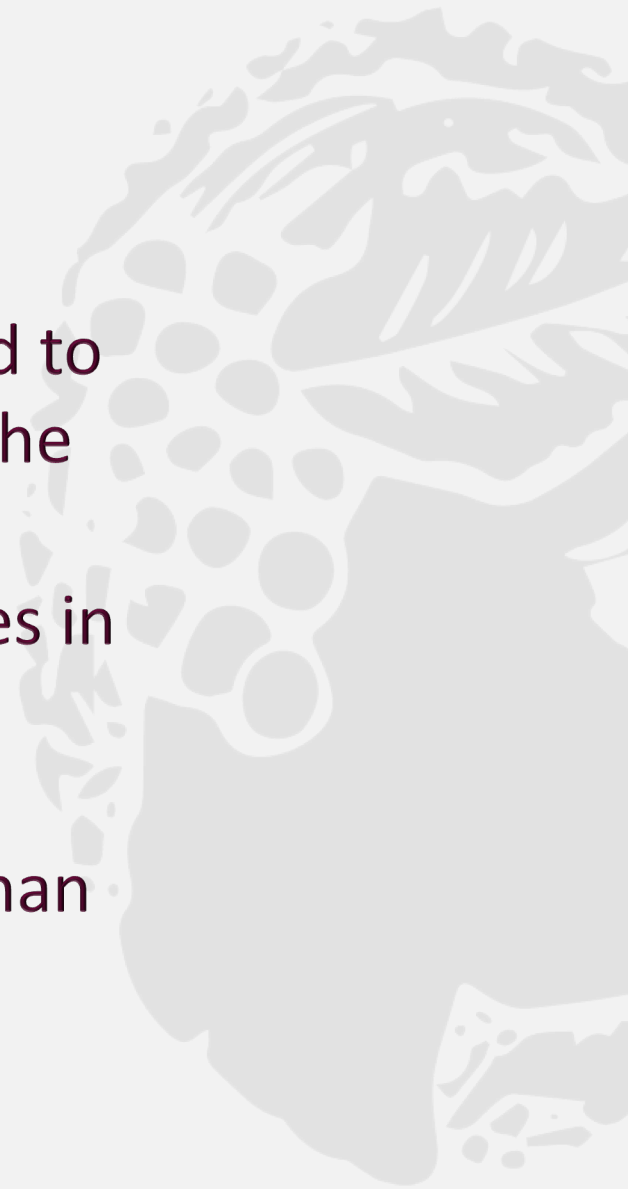
DISTRICTS & DISTILLERIES

Highland	Dalwhinnie, Glengoyne, Oban, Edradour, Glenmorangie
Jura	Isle of Jura
Mull	Tobermory
Skye	Talisker, Torabhaig
Orkney	Highland Park, Scapa
Speyside	Glenlivet, Glenfarclas, Knockando, , Glenfiddich, Balvenie
Campbeltown	Springbank, Glen Scotia, Glengyle (Kilkerran)
Islay	Ardbeg, Lagavulin, Laphroaig, Caol Ila, Bowmore
Lowland	Auchentoshan, Glenkinchie, Bladnoch, (3 only)



GRAIN WHISKY

- Made in a Patent rather than a Pot still
- Produced mainly from Maize, and other cereals ground to a flour then cooked under steam pressure to release the starch.
- A small amount of malted barley is added and enzymes in the barley convert the starch to sugar
- The wort produced is lower strength than malt worts
- Distilled to a high degree of purity, less flavoursome than malt, matures more quickly



OVERVIEW OF MALTING PROCESS



OVERVIEW OF DISTILLATION PROCESS



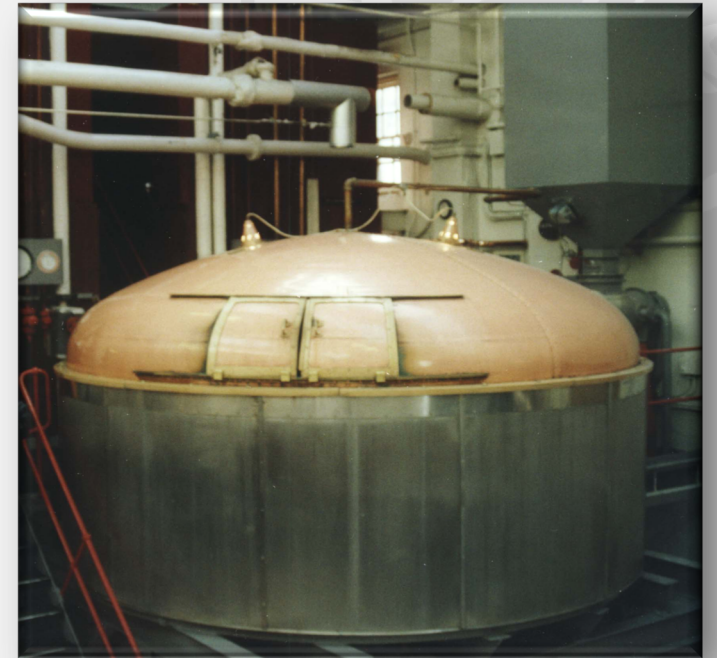
MALTING & KILNING

- Malting - The controlled germination of Barley to convert starches to sugar (Maltose)
- During germination, the malt is turned and then kilned to stop growth.
- Malt is dried by passing hot air and peat smoke over it. The amount of smoke may vary. It is traditionally found in Islay malts.
- The amount of peatiness is measured in Phenol levels.
- Most whiskies have two parts per million (ppm) phenols or less.
 - Bowmore 20-25 ppm
 - Lagavulin 30-35 ppm
 - Ardbeg 50-55 ppm
- Have distinctive peatiness evident.



EXTRACTION OF SUGAR

- **The Mash Tun**
- Used to extract the fermentable sugar (Maltose) from the cracked malt (Grist) by mixing it with heated water to produce a fermentable liquid. (Wort)
- **Water.**
- Distillers disagree on the best type of water to use (Hard or soft) but mineral content and the hardness or softness of the water have a distinct effect on the final product.



FERMENTATION

- Fermentation is carried out in Washbacks made of Larch, Pine or stainless steel.
- Experts value the use of wood to produce more complex wort related to the increased bacterial content
Lagavulin -Uses Larch **Ardbeg and Bowmore** -Oregon Pine replaced stainless steel.
- Short fermentation up to 40 hours produces spicy nutty flavours.
- Longer fermentations 60-100 hours produce greater complexity of flavour and aromas.
- Wort has an alcohol content of around 9% abv.



Yeast:

- Two types are used.
- Brewer's yeast and Distiller's yeast. (Distillers may use one or both types)
- Brewer's yeast produces a more aggressive fermentation and richer flavours.
- Yeasts can also affect the rate of fermentation.
- Slower fermentation allows more flavour compounds to develop thus increasing the complexity of the wort.

DISTILLATION

- Distillation of Malt Whisky is carried out in Pot stills
- 2 distillations are carried out.
 - The 1st distillation in the Wash Still converts the Wash at about 9% abv to Low wines at about 30% abv
 - The second distillation in the Spirit still concentrates the low wines to produce British Plain Spirit at around 73% abv.
- Copper stills are used as copper is much more reactive to the spirit than stainless steel.
- The dissolution of copper into the wash adds body and complexity to the spirit.
- The relationship between still size and amount of liquid and gas are important. The greater the contact the heavier and more complex the spirit.



WHISKY DISTILLATION



Lyne Arm

Swans Neck

The Ogee

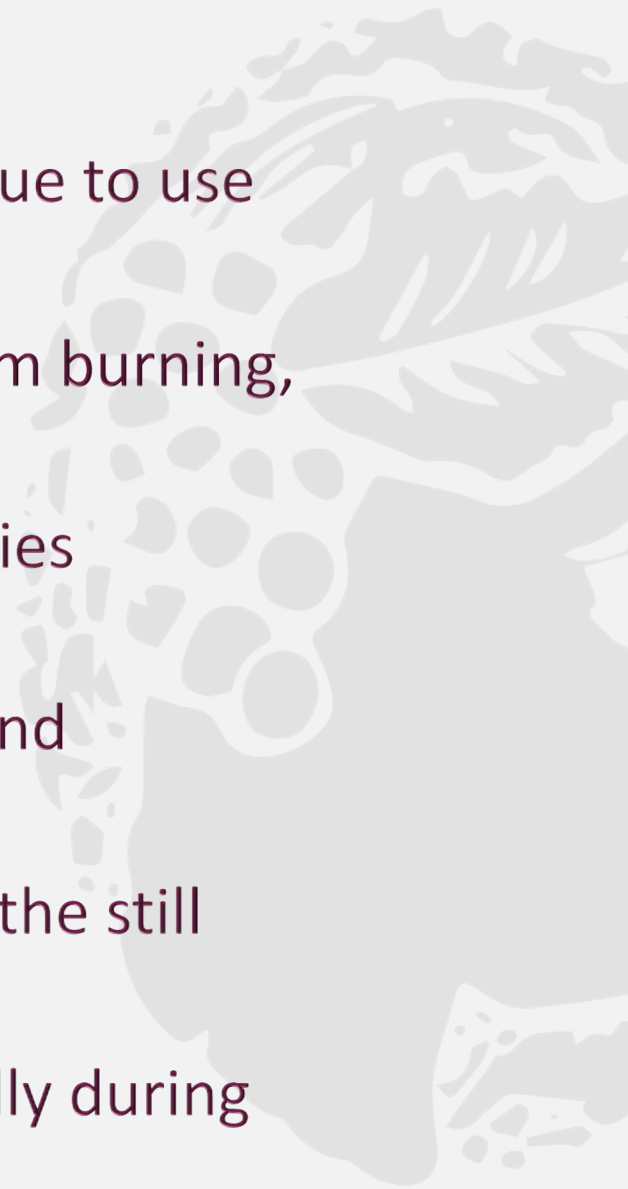
Spirit Still

Condenser

Wash Still

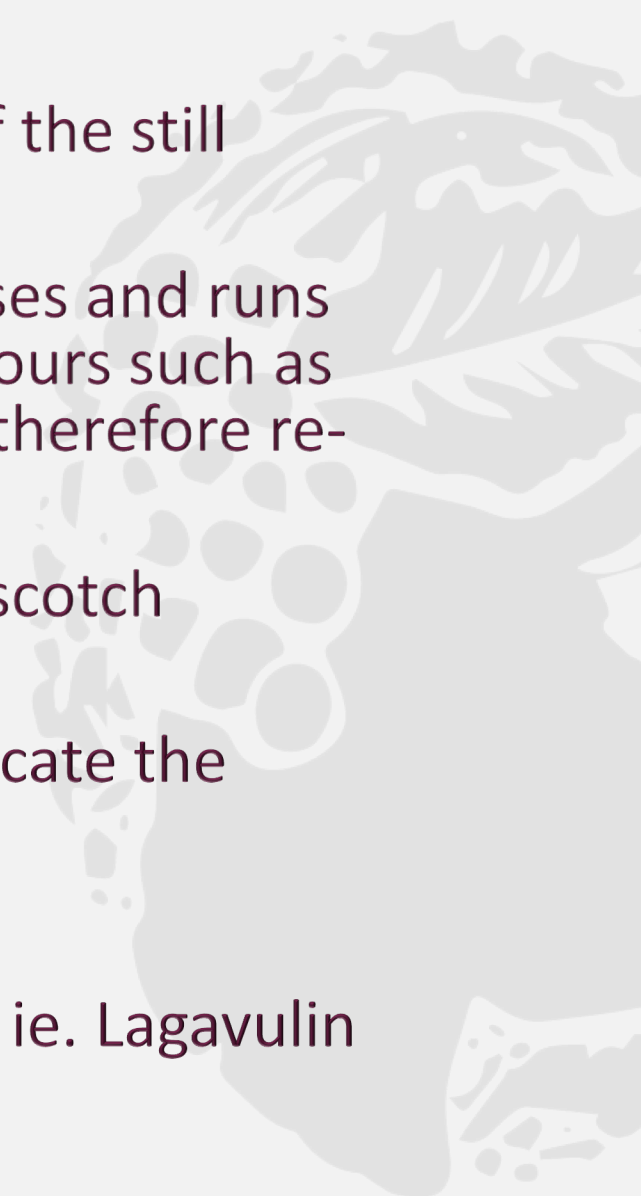
DISTILLATION

- ✦ Stills are heated with steam coils inside the Still, a few continue to use direct firing to the base of the still.
- ✦ In order to stop heavier solubles which fall to the bottom from burning, a Rummager (a rotating chain) is used to churn them up.
- ✦ This wears the still and increases the cupric element in whiskies produced by this method.
- ✦ Too rapid a distillation increases the oily matter in the neck and condenser leading to bitter flavours.
- ✦ It also allows unwanted water and feints to piggyback out of the still before they may be evaporated.
- ✦ Best whiskies are made with as low heat as possible, especially during the middle of the second distillation.



REFLUX

- The most important effect that differences in shape & size of the still have is in the amount of Reflux allowed.
- Reflux is the process whereby a part of the distillate condenses and runs back down the still. Lighter alcohols give lighter sweeter flavours such as citrus & pear drops & evaporate at lower temperatures and therefore re-condense less easily than heavier alcohols
- Heavier alcohols provide more bitter flavours such as Butterscotch Treacle and Espresso.
- The more reflux that is encouraged the lighter and more delicate the product.
- A tall still will encourage Reflux. ie. Glenmorangie.
- A squatter still will produce less Reflux and a heavier whisky. ie. Lagavulin



THE LYNE ARM

- The angle of the Lyne arm - the pipe connecting the still to the condenser is also important in governing the amount of reflux that occurs.
- If the arm has a sharp downward angle very little reflux occurs as the distillate has little chance of flowing back to the still.
- A still with a slight upward angle creates a great amount of reflux as the distillate can condense and flow back into the still at any point until it reaches the condenser.



THE OGEE

- A step in the wall of the still.
- This also encourages reflux, preventing the free flow of vapour up the still causing some to condense and fall back.
- The shape of the neck of the still may also encourage Reflux, for example, a trap in the base of the Lyne arm connected by a pipe back into the still.



THE CONDENSER

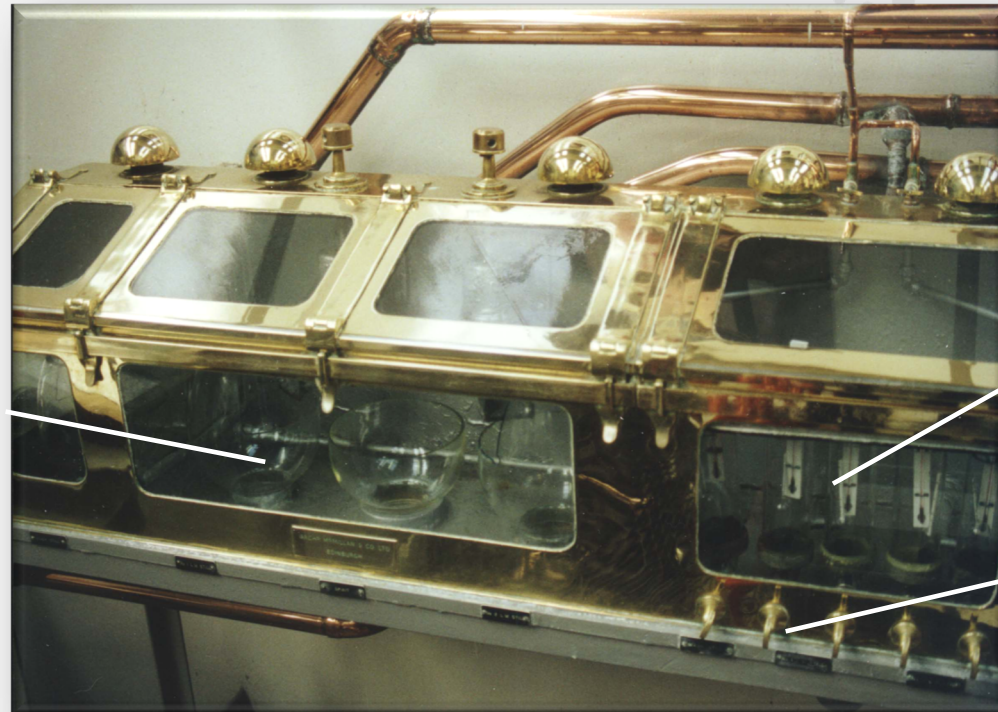
- After the distillate leaves the still it must be cooled.
- Modern condensers may do this more quickly than the traditional **Worm**
- Many distillers prefer to use the **Worm** as the distillate spends more time in contact with Copper and also cools more slowly.
- This retains more sulphurous compounds which add attractive “Gingery” flavours.



THE SPIRIT SAFE

- At the end of the second distillation in the spirit still the spirit collected is separated in the spirit safe to remove the Foreshots, and Feints.
- The collected spirit is referred to as **British Plain Spirit** and has an alcoholic strength of around 70% abv.
- It cannot be referred to as Scotch Whisky until it has matured in cask for a minimum of 3 years

Receiving vessels



Hydrometers
to measure
spirit strength

Controls to
direct
spirit flow

MATURATION

- The two main influences on maturation are:
- The type of cask used:
 - All Whisky must be stored in oak casks
 - Traditionally Sherry butts are used but many other casks from Bourbon, Port, Madeira, etc are now used.
- Where the cask is stored:
 - The warmer the climate the faster the whisky will mature
 - Cooler damper climates slow down maturation
 - Slower maturation may increase the complexity of the product.
- Each year approximately 2% of maturing whisky evaporates. (The Angels Share)
- In Islay, this accounts for only 1.5%, which is thought to be due to the damper climate and the fact that evaporating whisky is replaced by atmospheric water, which gives the Islay whiskies their distinctive iodene and salt tastes.



CASKS

- The length of time for which the casks were previously used to store liquids will have an effect on the Whisky.
- More oak related flavours will develop from casks used for up to three years than from older casks.
- Smaller casks also increase the effect of Oak.
- A wide range of used casks are used:
 - Port
 - Madeira
 - Bourbon
- Sherry casks were traditionally used, which may give a sweeter richer flavour and darker colour.
- This type of maturation is suitable for more robust whiskies.



STYLES OF SCOTCH WHISKY

■ **Single Malt:**

- A blend from casks of differing ages produced in a single distillery.
- Each malt has its distinctive flavour and style.

■ **Blended Malt:**

- A blend of Malt whiskies from several different whisky distilleries.
- Own-label malts are usually blends.

If Whisky declares an age on the label the age refers to the youngest whisky in the blend

Single Grain Whisky:

- The product of a grain distillery only.
- Light in style and more neutral than malt. (Cameron Brig)

Blended Whisky:

- A mixture of grain whisky with any number of malts.
- Standard blends rarely state an age on the label

Deluxe blend:

- Contains a higher % of more expensive older malts
- Often sold with an indication of age.



SCOTCH WHISKY BRANDS

The logo for CAOL ILA, featuring the brand name in a serif font.

Islay

The logo for BLADNOCH, featuring a stylized 'B' monogram above the brand name in a serif font.

Lowland

The logo for JURA, featuring the brand name in a bold, sans-serif font with a yellow background.

Isle of Jura

The logo for SPRINGBANK, featuring a stylized 'S' monogram above the brand name in a serif font.

Campbeltown

The logo for Ardbeg, featuring a stylized 'A' monogram above the brand name in a serif font.

Islay

The logo for GlenGoyne, featuring a circular emblem with a crown and the brand name in a serif font.

Highland

The logo for Glenfarclas, featuring the brand name in a stylized, cursive font.

Highland

The logo for TALISKER, featuring a circular emblem with a crown and the brand name in a serif font.

Isle of Skye

The logo for Auchentoshan, featuring the brand name in a serif font.

Lowland

The logo for HIGHLAND PARK, featuring a stylized 'H' monogram above the brand name in a serif font.

Orkney

The logo for ABERLOUR, featuring the brand name in a serif font.

Speyside

The logo for TOBERMORY, featuring the brand name in a serif font.

Isle of Mull

PORT DUNDAS

DUMBARTON

NORTH BRITISH

Scotch Grain Whisky

AMERICAN WHISKEY

- Federal regulations require that Whiskey is distilled to less than (95% abv) and reduced to not less than (40%abv)
- Above 95% it is regarded as neutral spirit.
- Distillation is carried out in patent stills



AMERICAN WHISKEY

- **Rye Whiskey:**

- Produced from a mash of not less than 51% rye + barley malt + corn.
- Aged in charred oak casks (Used only once)
- Product may not be labelled as straight unless aged for a minimum of 2 years and not blended with other Whiskies/Spirits
- Cannot bear an age statement unless it has been in cask for a minimum 4 years.

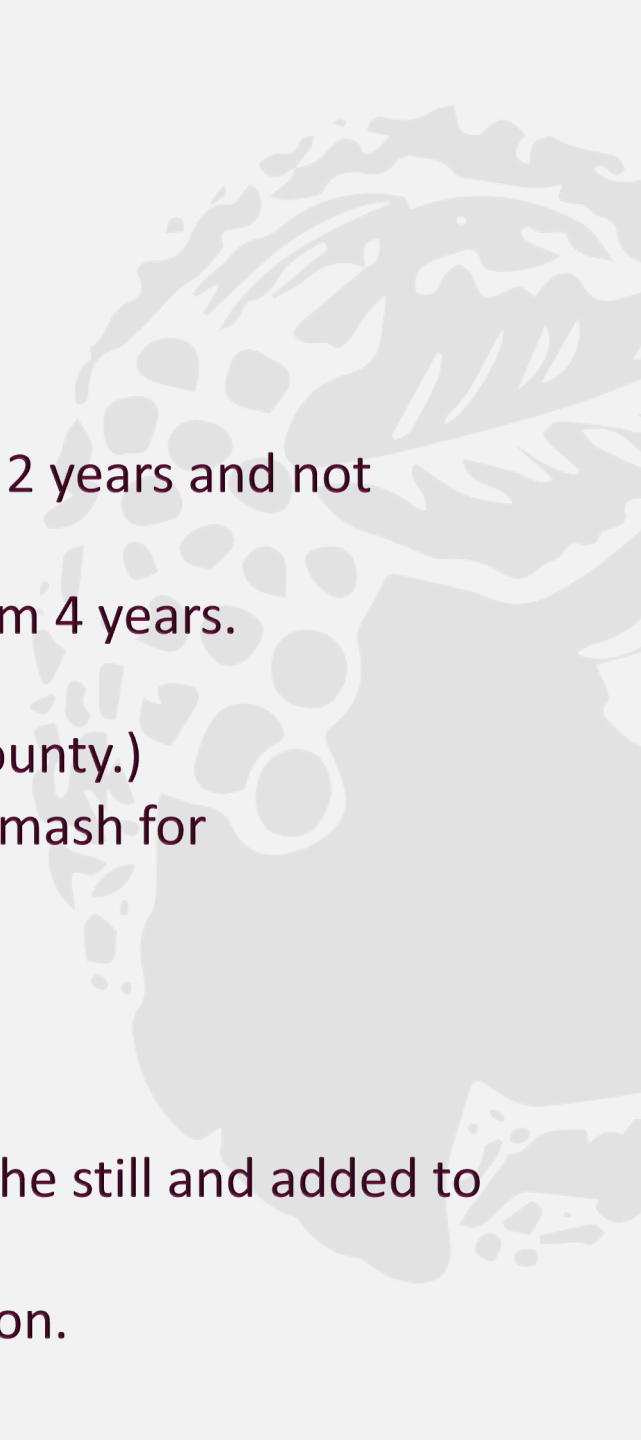
- **Bourbon Whiskey:**

- Named after Bourbon County, Kentucky (Now no distilleries in the county.)
- Principally distilled from corn mash (Min 51%) + Rye, wheat or barley mash for fermentation.

- Aged in charred oak not less than 4 years but up to 12 years.

- **Sour Mash:**

- The normal production method of all straight whiskeys.
- Residue from a previous distillation (backset) taken from the base of the still and added to the grain mash in the cooker or the mash in the fermenting vessels.
- Helps continuity of fermentation and prevents wild yeast contamination.



Straight:

- Applied to Rye and Bourbon means that has not been blended with neutral spirit.

Blended:

- Rye or Bourbon means that the product has a minimum of 51% with the remainder neutral spirit.

Corn:

- Made from a mash of not less than 51% corn + Barley malt
- Not aged in charred oak.

- **Tennessee Whiskey:**

- Sour mash whiskey (Jack Daniels)
- Unique filtration process before ageing
- Uses Charcoal filters 3m deep
- The process lasts 10 days to leach out fusel oils but adds a distinctive taste from the burned sugar maple used in filtration



AMERICAN SINGLE MALT WHISKEY

- Must be produced using 100% malted barley. The malting process (and all production) must occur in the United States.
- Distilled to no more than 80% ABV. in a single distillery located in the US.
- Must be aged in oak casks. With a maximum capacity of 700 litres.
- Ageing is to take place in the United States.
- Casks can be of used oak, charred new oak, or un-charred new oak.
- The producer has the choice of what type to use.
- It must be bottled at a minimum of 40% ABV.
- There is no minimum ageing requirement.
- American Single Malt Whiskey that has been aged for at least two years in cask may be labelled with the term straight.



BLENDED WHISKIES

- A blend may contain as many as 75 different whiskeys and neutral spirits.
- No more than 20% straight whiskey & the remainder neutral spirit.
- Lighter in body and taste.
- eg. Seagrams 7 Crown, Calvert extra, Fleischmanns



WHISKEY BRANDS

Michters Pennsylvania (38% rye 50% corn 12% Barley)

Old Overholt Kentucky - Straight rye

Old Grandad Francfort, Kentucky. Bourbon

Old Crow Full-bodied Bourbon Francfort, Kentucky

Wild Turkey Lawrenceburg, Kentucky. Bourbon. It also produces a straight rye.

Jim Beam Bardstown, Kentucky. Straight Bourbon and Rye whiskey.

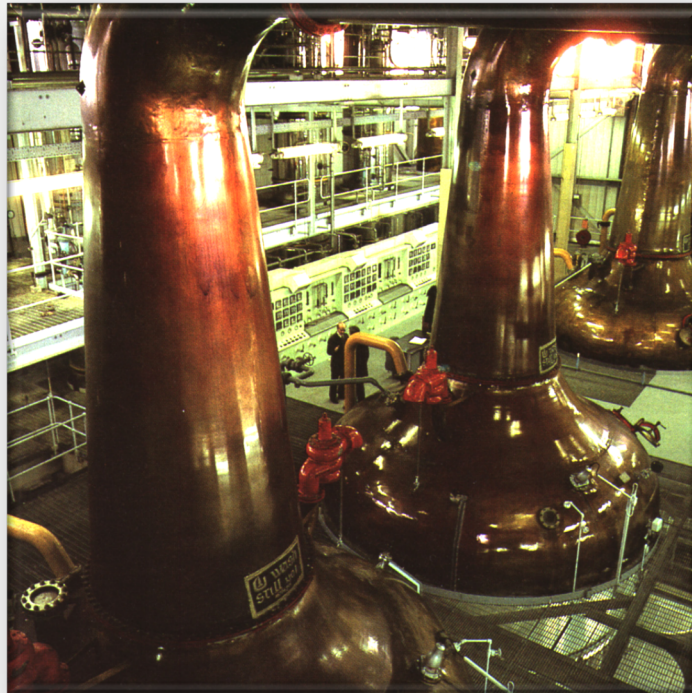
I.W. Harper Louisville, Kentucky. Straight Bourbon. Light body.

Jack Daniels Lynchburg, Tennessee. Sour Mash



IRISH WHISKEY

- Irish whiskey is produced by distilling a blend of malt and raw barley in pot stills.
- Kilning of the malt over peat fires is rarely done.
- Distilled 3 times with higher alcohol content will influence the flavour of the product.
- Stills are larger than for Scotch Whisky production
- Shape and larger surface area affect flavours.



- The Irish Pot still
- Larger than the Scotch pot still
- The shape and surface area and the way that Liquids and vapours Interact, play a vital part in the flavour of the final product.



1	Bushmills Antrim	13	Boann Meath	25	Royal Oak Carlow
2	Copeland Co Down	14	Slane Meath	26	Powerscourt Wicklow
3	Echinvile Co Down	15	Connacht Mayo	27	Glendalough Wicklow
4	Hinch Co. Down	16	Irish American Mayo	28	Ballykeefe Kilkenny
5	Rademon Co Down	17	Lough Mask Mayo	29	Glendree Clare
6	The Crollly Donegal	18	Pearce Lyons Dublin	30	Waterford Waterford
7	Sliab Liag Donegal	19	Roe & Co Dublin	31	Blackwater Waterford
8	Lough Gill Sligo	20	Dublin Liberties Dublin	32	Irish Distillers Cork
9	The Shed Leitrim	21	Teeling Dublin	33	Blacks Cork
10	Kilowen Co Down	22	Slane Meath	34	Clonakilty Cork
11	Great Northern Louth	23	Kilbeggan Westmeath	35	West Cork Distillers Cork
12	Cooley Louth	24	Tullamore Offaly	36	Dingle Kerry



PRODUCTION & MATURATION

- Three elements of distillation.
- **Malt:** Forms structure of distillation. (40%)
- **Raw Barley:** contributes greatest character. (60%)
- **Grain spirit:** Lightens the blend.
- Spirit is distilled to neutral flavours unlike Scotch grain whisky.
- Matured for a minimum of 3 years (US market 4 years) in old sherry or Bourbon casks.
- Average maturation period 12-15 years.
- Blending (Vatting) takes place in Dublin and Cork.



JAMESON
IRISH WHISKEY

Corrnmara
Proved Single Malt
IRISH WHISKEY

KILBEGGAN
IRISH WHISKEY

TULLAMORE
DEW
Est. 1829
The Legendary
IRISH WHISKEY

BUSHMILLS
IRISH WHISKEY

IRISH WHISKEY TYPES

- **Single Malt:**

- Bushmills 10,16, and 21 years old, Tullamore Dew.
- Connemara Peated Malt, The Irishman,

- **Single Grain:**

- Greenore 8 and 10 years old.

- **Pure Pot Still:**

- Made from 100% barley (malted and un-malted) blended with single malt.
- Redbreast 10/15 years. Jameson 15 years old Pure pot still, Writers Tears.

- **Blended:**

- Bushmills Black Bush, Jameson, Powers.





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