



Whisky and Malt

How the Malting Process Affects Whisky Flavor

“There is an ancient Celtic axiom that says ‘Good people drink good beer.’ Which is true, then as now. Just look around you in any public barroom and you will quickly see: Bad people drink bad beer. Think about it.”

– Hunter S. Thompson

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BIO

- Certified Cicerone, homebrewer, and BJCP judge.
- BAR 5 day graduate
- CSS and CSE
- USBG Master Mixologist
- Teacher’s Aide at UNLV Hospitality spirits program



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INTRODUCTION

- Have you ever wondered about certain flavors like chocolate, biscuit, and toffee in your favorite whisk(e)ys?
 - How did these flavors get in there?
 - What ingredients within the whisk(e)y or the production process that give it these divine flavors and aromas?



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What are we doing today?

- History of Malt and Grains
- What exactly is malt?
 - Science
 - Production
- Types of malted grains
- Fermentation
- Distillation

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History of Malt

It's got to start somewhere!

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Malt History – Early Humans

Early Humans (23,000 years ago)

- Not just hunting, but gathering



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Malt History – Early Humans

Early Humans (10,000 BC)

- Hey, let's chew this sprouted grass because I am hungry and it is quite soft.
- The cultivation and domestication...



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Malt History - Antiquity

Egyptians and Sumerians (4000 BC)

- A methodical process develops.



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Malt History – Medieval Europe

Medieval Europe

- The monks weren't just praying.



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Malt History – Uisce Beatha

In Ireland – 1170 AD

- It didn't start in Scotland?!?!
- When Henry II invaded Ireland in 1170...



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Malt History – Meanwhile, in America

In 1588

- The “new” grain.

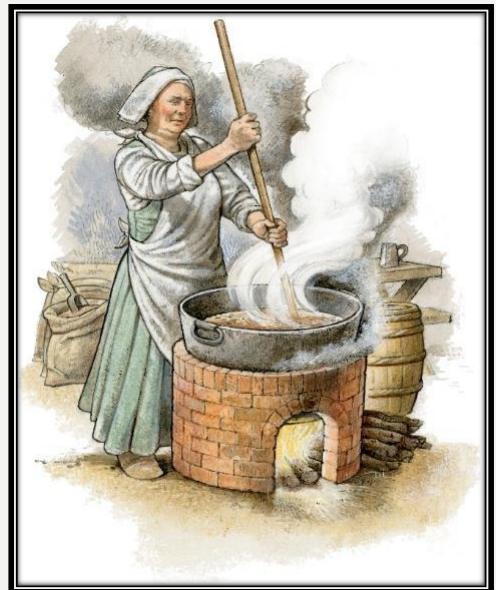


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Malt History – English countryside

In 1623

- The English housewife.
- Was an essential skill.

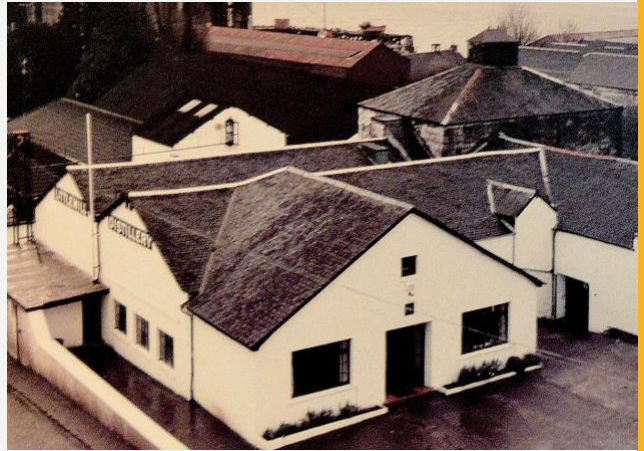


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Malt History – Single Malt Distilling

18th century Scotland

- The single malt whiskey category becomes a “thing”.



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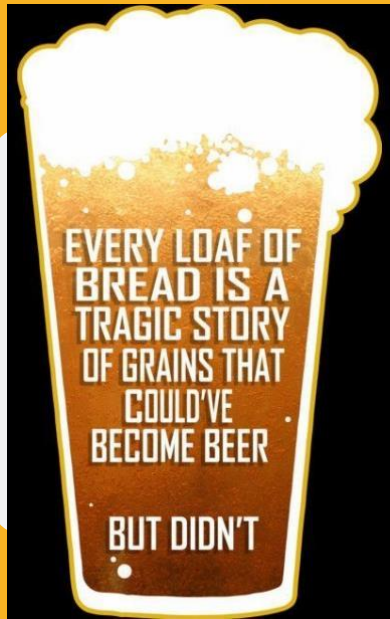
Malt History – Louis Camille Maillard

In 1912

- The Maillard effect
- More on this later



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Some deep thoughts!

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What really is malt?

The science and art of this often, underappreciated and misunderstood ingredient.

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Things that we just gloss over

When we talk about “malt” in Scotch or another whisk(e)y we just move on.

But what does it really mean?

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Malt is a modified cereal grain that has been allowed to germinate and sprout

Malted oats



In the case of whiskies these grains are mainly...

Corn

Rye

Wheat

Barley

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Why is barley so important?

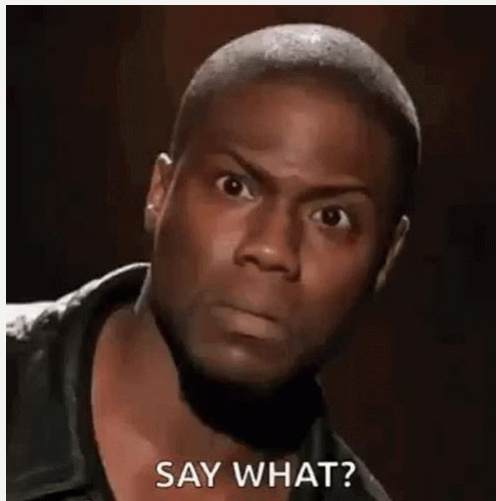


Barley, the superstar grain.

- Enzymes built in
- Scotch regulations.
- No barley in the mashbill, huh?

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So the question is, why does malt get lost in the mix?



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In Beer...

Most often the other ingredients get all the love

- Hops
- Adjuncts

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In Whisk(e)y

- Peat
- Corn
- Oak

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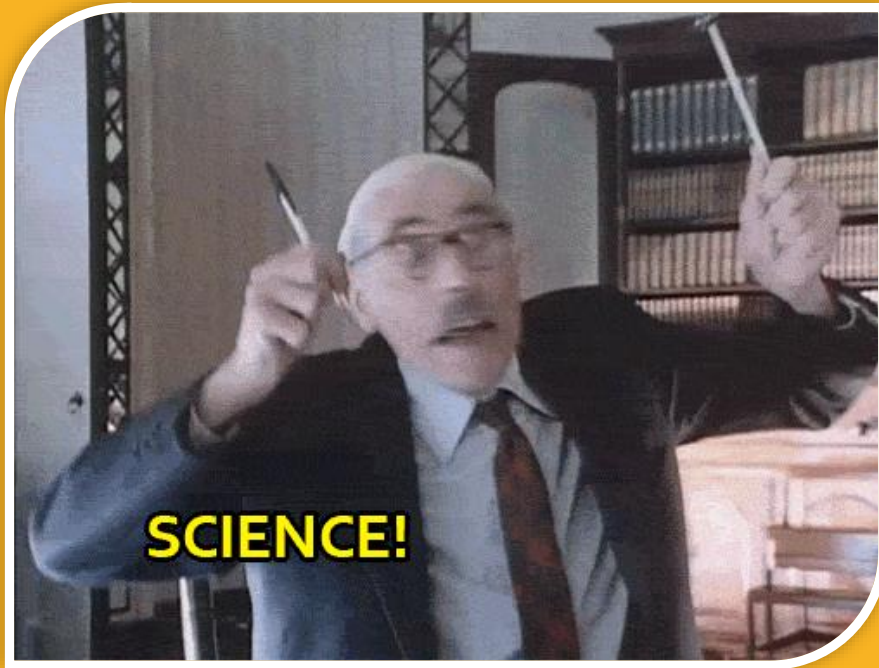
**Malt is the common
thread between them
all but it doesn't get
all the love.**

Let's change that!

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But first...

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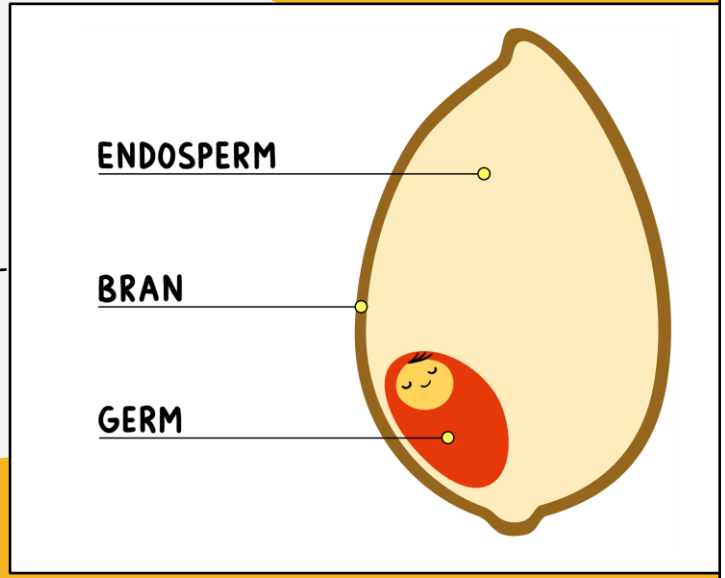
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The malting process

All my nerds, UNITE!!!

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A grain egg?



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Malting Process

3 part malting process

- Steeping
- Germination
- Kilning

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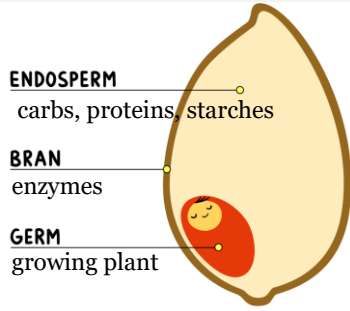
Steeping

- Grains are soaked in water
 - Spring time!
 - Clean it up
- Increases grain moisture level

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Germination

The Grain Kernal



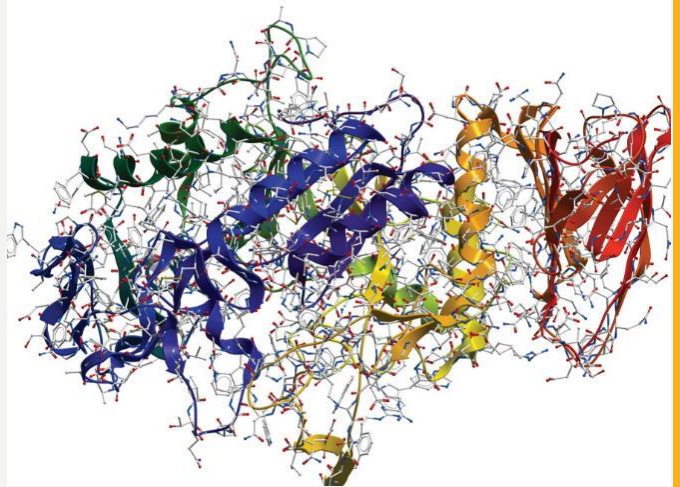
Germinated barley kernel



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What are these enzymes you speak of?!?

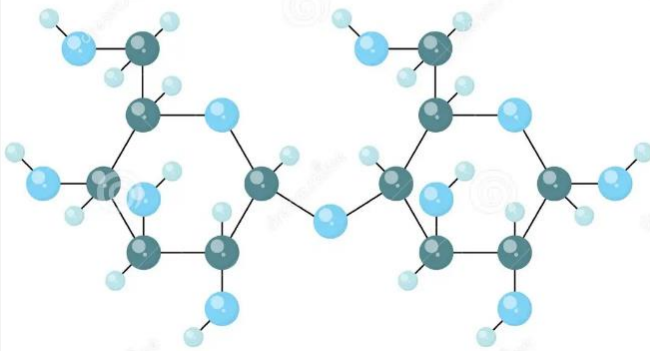
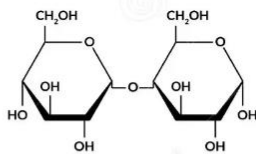
- What are they?
- What do they do and how do they do it?
- Ama-what?
- It's ability



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What does the enzyme break the starches down into?

Structural Formula of Maltose:



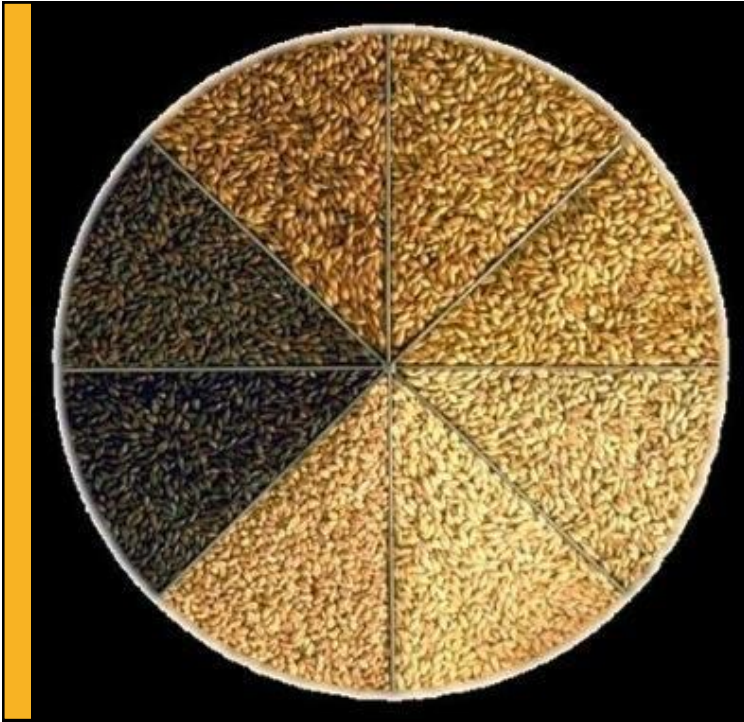
More simple fermentable sugars like...

Trisaccharides

Disaccharides

Monosaccharides

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Kilning

- Stop right there!
- Remove moisture
- Turn up the heat.
- BE careful.

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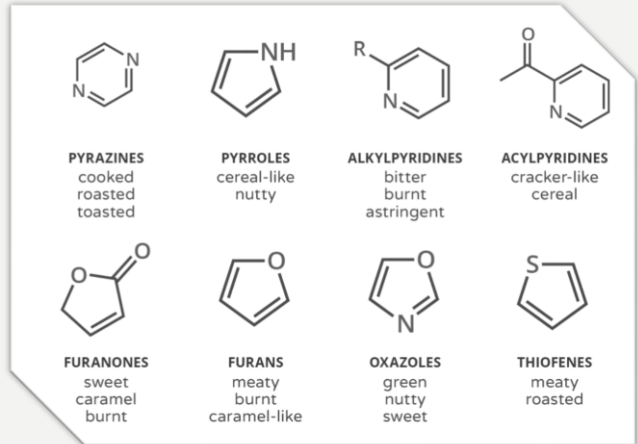


**Magic is
happening**

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Mela-huh?!?

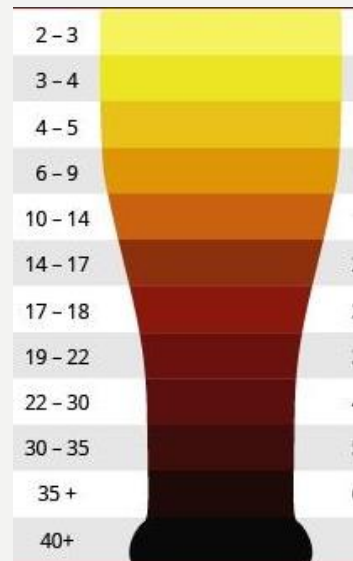
- You heard me right, Melanoidins!
- How?
- What?
- Why?



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SRM – BEER COLOR

- SRM (Standard Reference Model) – A measure of beer color intensity.
 - Straw to Deep Gold: 2-6 (American light lager to Belgian Blonde Ale)
 - Amber to Deep Amber: 7-10 (American Pale Ale to Saison)
 - Light copper to Deep Copper: 11-17 (English bitter to Doppelbock)
 - Light Brown to Brown: 18-22 (Dunkel Weizen to Dark Mild Ale)
 - Dark Brown: 23-30 (Schwarzbier to Baltic Porter)
 - Very Dark Brown: 31-35 (Oatmeal Stout)
 - Black: 30+ (Irish Stout)
 - Black, opaque: 40+ (Imperial Stout)



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TIME FOR AN APPROPRIATE BAD DAD JOKE.

What do vegetarian zombies eat?

GRAINZZZ!



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What do certain grains taste like in whisk(e)y?

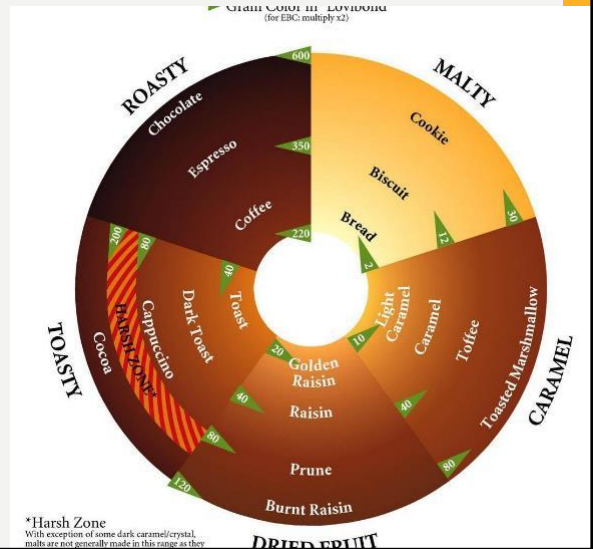
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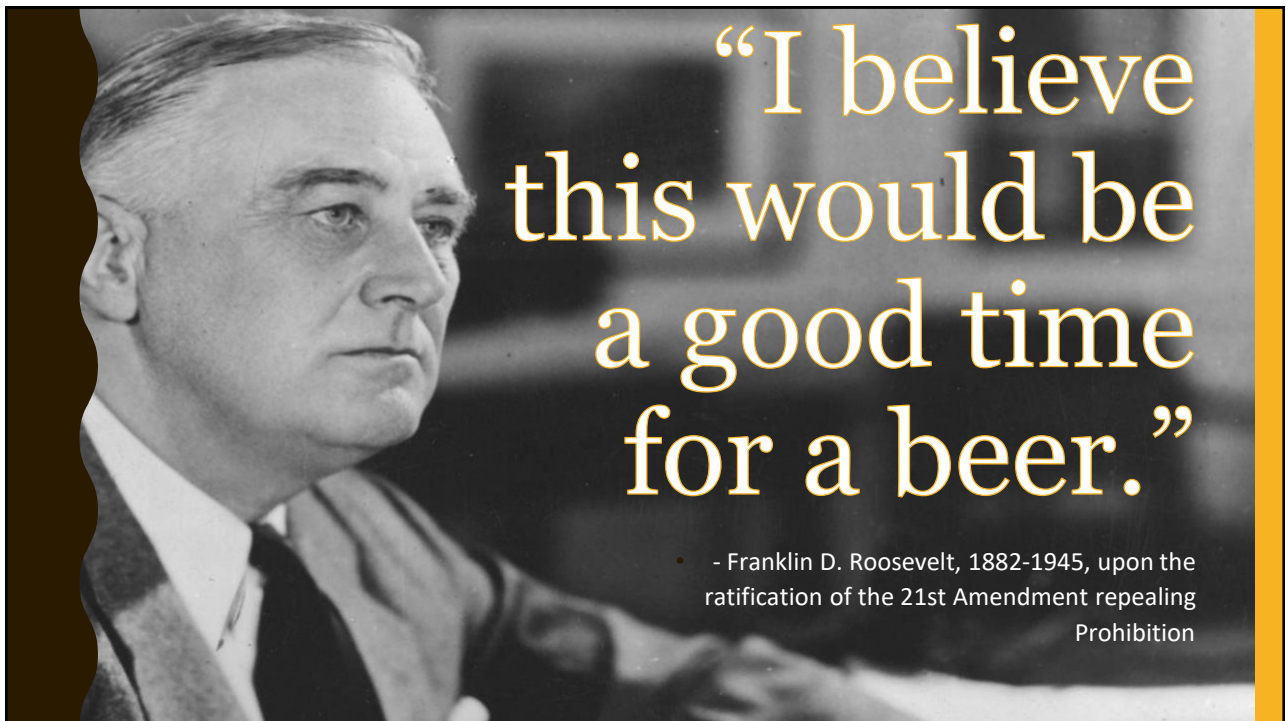
MALTED BARLEY TYPES

1. Base Malts
2. Kilned/Color Malts
3. Crystal or Caramel malts
4. Roasted Malts & Grains

Note: When we taste the beers, focus on the malt profiles and not on other characteristics (hops, esters/phenols from yeast, etc.)



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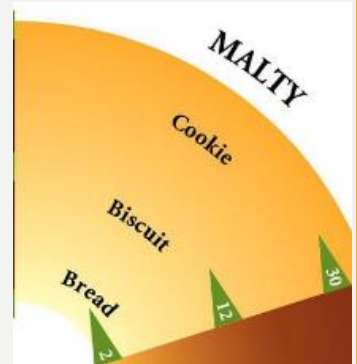
Tasting Vocabulary

- CEREAL
 - Cookie, Biscuit, Bournvita, Cereal, Hay, Horlicks, Husky, Malt, Muesli, Ovaltine, Pastry, Rusks, Ryvita
- SWEET
 - Honey, Sweet
- Burnt, Toast, Roast
- NUTTY (GREEN) Beany, Cauliflower, Grainy, Grassy, Green pea, Seaweed, Bean sprout
- NUTTY (ROAST) Chestnut, Peanut, Walnut, Brazil nut
- SULPHURY
 - Cooked vegetable, DMS, Sulphidic, Sulphilic
- HARSH
 - Acidic, Sour, Sharp
- TOFFEE
 - Toffee, Vanilla
- CARAMEL
 - Caramel, Cream Soda
- COFFEE
 - Espresso Coffee
- CHOCOLATE
 - Dark Chocolate
- TREACLE
 - Treacle, Treacle toffee
- SMOKY
 - Bonfire, Wood fire, Peaty, Wood ash
- PHENOLIC
 - Spicy, Medicinal Herbal
- FRUITY
 - Fruit Jam, Bananas, Citrus, Fruitcake
- BITTER
 - Bitter, Quinine
- ASTRINGENT
 - OTHER
 - Astringent, Mouth puckering
- LINGER
 - Cardboard, Earthy, Damp Paper Duration/Intensity of after-taste

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BASE MALTS

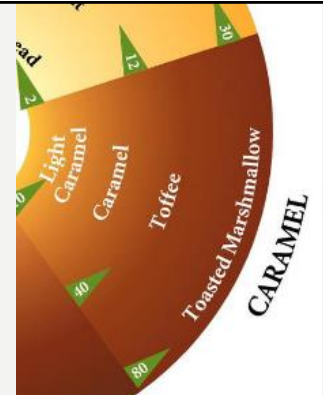
- Gently air dried with heated air at 140°F
- **Color:** Paler colors
- **Varieties:** Pilsner, Pale Ale, Vienna, Munich, etc.
- **Flavor/Aromas:** From uncooked bread dough to bready and biscuity
- Tasting: Munich Helles
- Forms the **majority of the grist** for a beer and **almost all the fermentable sugars** in most styles.



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KILNED / COLOR MALTS

- Roasted up to temps of 240°F
- Used in small amounts within the mash bill and will add some fermentable sugars
- **Flavors/Aromas:** Light sugars (brown sugars, caramel, etc), bread crust, nutty.
- **Color:** Amber to Brown
- **Varieties:** Dark Munich, Amber, Biscuit, Brown Malt, Pale Chocolate
- **Beer Styles:** Amber, Red, and Brown Ales, classic Porters
- Tasting: American Amber ale



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CRYSTAL & CARMEL MALTS

- **Mashed** within the husk **140° - 150°F** prior to **kilning**, this converts the starches into sugars, and in turn caramelizes those sugars with the **addition of kilning heat (250°-320°F)**.
- **Color:** Dark golden to light brown
- **Flavors/Aromas:** Dried fruits (raisins, prunes, etc) and dark burnt sugar (toffee, molasses, etc).
- Used in very small amounts and adds small amount of fermentable sugars
- Contributes color and loads of flavor
- Styles: Trappist Dubbels, Wee Heavy, Doppelbocks
- Tasting: Belgium Dubbel

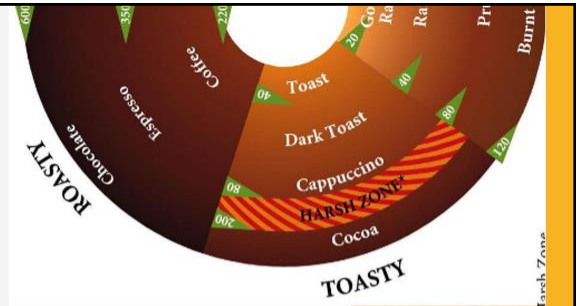


Caramel 10-20L
Caramel Vienna 30L
Caramel Munich 60L
Caracrysta® Wheat (55%)
Carapils® (1.5%)

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ROASTED MALTS

- Made from pale malts that have been heated to **320°- 430°F**
- **Color:** Dark Brown to Black
- **Flavors/aromas:** Coffee/espresso, Chocolate, and highly roasted foods.
- Used in very small amounts and contributes mainly color and dry acrid flavors.
- Styles: Modern Porters & Stouts



- Carabrown* (55°L)
- Chocolate (50°L)
- Dark Chocolate (420°L)
- Black (500°L)
- Blackprinz Bitterless (500°L)
- Midnight Wheat Bitterless (550°L)
- Roasted Barley (300°L)
- Black Barley (500°L)

Fermentation

Malt + Fermentation goodies = fine whisk(e)y!

Something else is produced during fermentation!

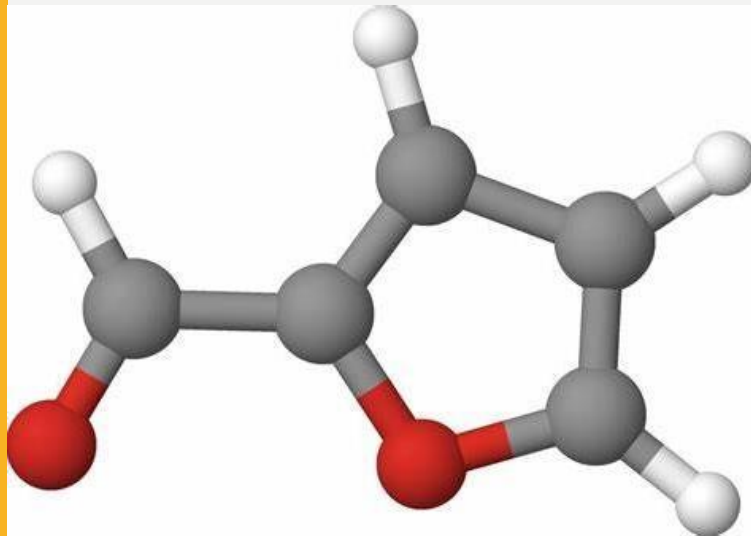
Congeners

- Acids
- Aldehydes
- Esters
- Other compounds
- Not a congener, but lees

Fusel Oils

- Methanol
- Amyl alcohol
- N-propyl
- Isobutyl alcohol

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MRPs

Small molecule Maillard
Reaction Products

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Distillation

Choosing the right still to get those malty flavors to shine!

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But first...

Let's take a drink of whisk(e)y!

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Pot stills

Why pot stills?

There are different shapes and sizes

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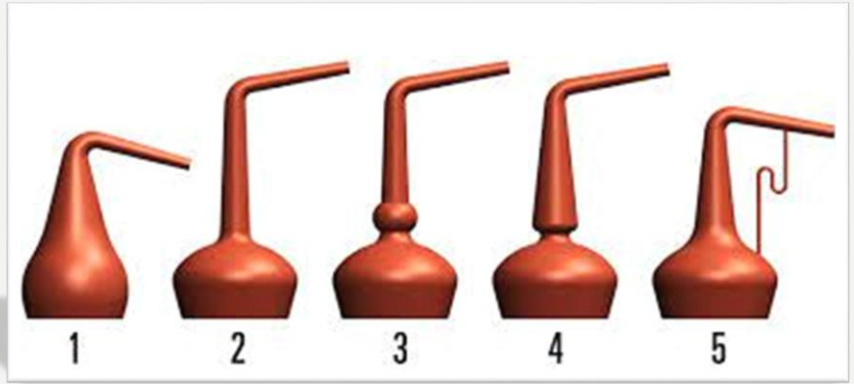
Reflux?

- What is it?
- Why is it important?
- Distillation equipment considerations

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Lyne Arm

- What is it?
- Angle has impact
- What the heck is a boil bulb?



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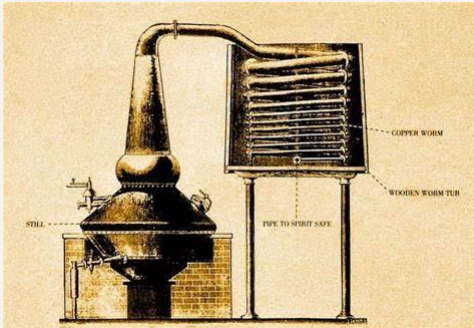
Still height

- Is directly related to reflux

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Condensers

Worm Tub



Shell and Tube



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In short,

We want to retain as much of those malty flavors produced during malting during the distillation process.

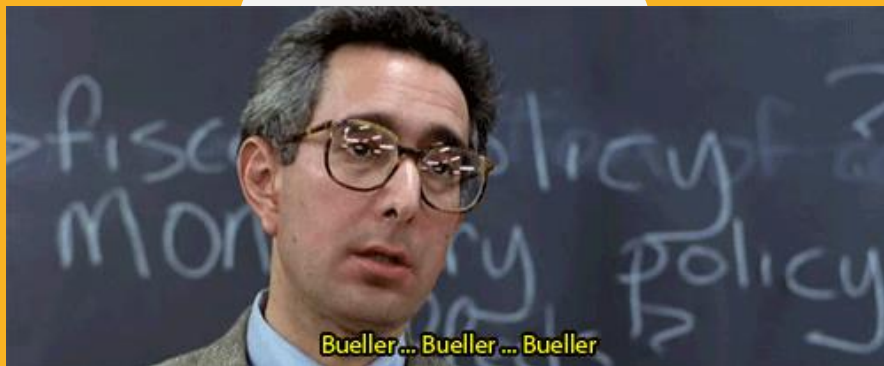
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IN CONCLUSION

- Malted barley production process and how it influences the finished spirit.
- Types of malted barley
- How can this information be utilized in the Bartending and/or Mixology community or why should bartenders care?
 - Greater understanding and appreciation of beer and all spirits distilled from grain.
 - Information can help the bar community understand distilled spirits (aged and unaged) that use malted barley in the mash bill.
 - Craft spirit producers are using specialty malts and understanding the process used to make these will help the bartender understand the flavors/aromas in the final distilled product.
 - Why does my single malt whisk(e)y taste the way it does.

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ANY QUESTIONS?



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Thank you!!

If there are no other questions I would like to thank you for your time!

