HOW TO MASH MOST DISTILLABLE INGREDIENTS

You just found a new ingredient, awesome!
Does most of its energy come in the form of carbohydrates (starch or sugar)?

No → It may still be fermentable. But its a specialty case and outside the realm of this flow diagram. Good luck!

Yes

Is it mostly starch or sugar?

Starch → Is the starch Gelatinased?

No → Gelatinase The Starch

Gelatinization allows the starch molecules to become water soluble.

Generally this is accomplished by boiling the ingredient in water for around 60min.

Yes → Dose it contain enough Enzymes?

No → Add Enzymes

You NEED enzymes to mash, most importantly Alpha Amylase.

You can buy packaged enzymes. Malted barley is also often used

Yes → Mash The Starch

Mashing converts long chain starches to more simple sugars.
Hold the mash at a certain temp for 60-120 min 64c/147f if using malted barley, follow the temp instructions on the packet if using packaged enzymes

Sugar → Mix With Water

Mix the sugar with water. Depending on what form it comes in you may wont to heat some of the water to help it dissolve.

Aim for a potential alcohol of 8-14%. Use the calculators at chasethecraft.com.

How fermentable is the sugar mixture?

Low → Are you worried about overall yield?

Yes → GlucoAmylase

GlucoAmylase will convert non fermentable sugars to fermentable sugars.

Follow the temp guidelines on the packet. Generally added after mashing while cooling to pitching temp.

High

Ferment!

Generally 5-10 days to ferment.
There are whole range of yeast strains that are available. Check chasethecraft.com for some examples.

Nice work you made it!

DISTILL IT!

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CHEAT SHEET FOR THE FLOW DIAGRAM

Carbohydrates

Remember that carbohydrates range from simple sugars up to complex starches. You should be able to guesstimate fairly well what contains a decent amount of carbs. But its pretty easy to quickly google things to ch
For example potatoes do contain starch and sugar. But they are not a dense or efficient source for carbohydrates.

Good examples of the kinds of "ingredients" you can look for:
Grains, beans, flours, backed goods, cereals, sugars (white, brown, molasses, golden syrup etc), fruits, candy, malted products, drinks etc etc etc. **Get Creative!**

Recognising Pre-Gelatinised Starch

Heating starch in the presence of water will gelatinise it (generally to temps near or above boiling). So starch that has been cooked "wet" in ingredients /products you find is most likely already gelatinased. Remember all malted grains will fall into this category.

Things that likely already have geled starch: malted barley/grain (including corn!), baked goods (bread, donuts, croissants, cakes etc), most breakfast cereals (excluding raw muesli etc), most chips (corn, potato, rice etc), most crackers etc etc etc

What Contains Enzymes Already?

For the sake of our purpose we need relatively high diastatic power products (see below). That means often things that "have their own enzymes" just are not going to cut it for our purposes. Sure you can make it work, enzymes are not "used" up. But you may also need to mash for a VERY long time.

In general any malted grain that is advertised as a "Base Malt" from a home brew store will have plenty of enzymes to convert itself and at least its weight again of other starch. This is most often malted barley, but can also be wheat rye etc. Just be aware just because its malted dosnt mean it has enzymes!

Diastatic Power

Diastatic power is a way of expressing the enzymatic power of a ingredient (normally talking about malted grains). The higher the diastatic power the more enzymes the grain has in it meaning it can successfully convert more starch to simple sugar in a reasonable time (say 60min). measured in degrees linter.

The goal is for any mash to be above 40 degrees linter. Many malted grains have way more enzymes than they need to convert themselfs. There are calculators out there (the chasethecraft.com one will be back up soon!). But the general idea is to average the weight and diastatic power of all starch involved. So 1 measure of malted barley with a diastatic power of 120 can convert itself + double its own weight of another starch.

Note On Glucoamylase

Glucoamylase (as we are using it here) primarily breaks dextrin down into more simple sugars (mostly glucose). Assuming you started with a solution that contained dextrin glucoamylase will make it more ferment-able. Its not a wonder drug that will make anything ferment-able. But if your not sure if it will help its not going to hurt to throw some in.

Ferment-ability After Mashing

As a rule of thumb if you mashed using malted barley to provide the enzymes AND mashed at a lower temp (63-65c / 145-149f) your wash is likely to be fairly ferment-able. Fermenting at a lower temp promotes beta amylase over alpha amylase producing a more ferment-able wash/wort. Dosing with Glucoamylase will likely help to dry it out a touch more though.

If you mashed with bottled Alpha Amylase only you almost certainly should use glucoamylase afterwards.

Gelatinisation Tips

The easiest way to gelatinise starch (for our use) is to boil it in water. I would suggest starting with a ratio of 1:4 starch to water (volume not weight). Leave room to add more water as it will swell and thicken considerably.

Different starch sources gel at different temps. But its almost always most efficient to bring it up to a simmer for around 1 hour. The chunkier the starch is crushed/milled the longer you will need to boil it for.

As starch gels its going to get thick. VERY thick . Think grits or porridge/oats. That can be very hard to deal with, its recommended to "sacrifice" some enzymes to keep things thin. Periodically throughout the gelatinisation process add a small amount of malted barley or alpha amylase. The enzymes will denature ("die") quickly but will thin things out significantly before they do.

High Temp Alpha (HTA)

High Temp Alpha Amylase dose exactly the same thing as the "standard" version it just operates and denatures at a much higher temp (up to around 95c / 203f). You can technically gelatinase most starch at this temp. In practice however it still seems to be more practical to simmer the starch and add sacrificial doses of HTA (as above). Because its denaturing temp is much higher you wont need to add it as often.

Secondary & Funky Fermentations

You can, if you wish, decide to utalise a secondary or funky fermentation involving other types of microbes. Lactobacillus, brettanomyces or even fungus. These other microbes can "eat" some of un-fermentable sugars left over after the brewers or distillers yeast is finished adding interesting flavors and aromas. Rum is famous for it!
Sometimes ensuring that a wash/wort will ferment out totally dry is not the best option. Thats why we added the "are you worried about overall yield" question above.