A BEGINNER'S GUIDE

THE EASIEST & CHEAPEST WAY TO BREW YOUR FIRST BEER

I. Background

Brewing your own beer is a lot of fun! Nothing beats the satisfaction of drinking one of your own beers and it opens up a whole new world of diverse styles, flavours, and aromas not accessible through commercial beers.

However, starting your first brew can be intimidating & confusing, even with (or perhaps, because of) all the available online resources. This guide has therefore been developed specifically to give you only the most relevant information you need to brew you first beer, while keeping it is as simple and cheap as possible, locally relevant, and easy to follow. To achieve this an **extract brew** is described here, which requires considerably less time, effort, and equipment than *all grain* brewing.

Most beer is prepared using only four ingredients, i.e., barley malt, hops, water, and yeast; and most homebrew methods consist of only three basic steps:

1. *Wort preparation*,
2. *Fermentation*, and
3. *Packaging and Conditioning*.

Wort is the sweet, malty, and bitter liquid extracted from barley malt and hops that flavours beer and serves as a food source for yeast to grow in - converting the sugars into alcohol and CO_2 as it does (and in effect, the wort into beer); a process called **fermentation**.

In extract brewing you start with a concentrated wort that has already been prepared according to the style requirements of your chosen beer style. You must just dilute it under sanitized conditions and start the fermentation process by adding the yeast. Then, once fermentation has finished, you only have to bottle your beer and allow it to condition before drinking it. **Bottle conditioning** is the process of allowing the residual yeast in the beer to ferment a small amount of added sugar (**priming sugar**), in the sealed bottle. The resulting CO_2 cannot escape and therefore dissolves in the beer, effectively **carbonating** it.

On average, for extract brewing, wort preparation takes less than an hour, fermentation ±5 days, bottling 2 hours, and conditioning ±7 days. The final step is to cool down your beer and then enjoy it!

II. What you'll need & what it will cost

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EQUIPMENT[1, 2]			
Nr	**Item & Notes**	**Approx cost**	**Images**
1	Fermenting bucket (fermenter) with lid & tap Notes: - Food grade buckets with sealable lids are available at most plastic shops	R 110	

2	Airlock Notes: - Either a S-type-bubbler <u>or</u> a blow-off tube - Blow-off tubes can be easily constructed using micro irrigation fittings and a glass coffee bottle	R 40	
3	Stick-on thermometer Notes: - To measure and manage the temperature of your wort and fermentation	R 40	
4	Bottles Notes: - Either crown cap, glass bottles <u>or</u> PET (plastic) screw cap bottles - Reusing commercial beer bottles works well, EXCEPT those with twist-off caps - For a 23L batch you'll need ±50x 440ml brown, beer bottles or ±45x 500ml PET bottles	(new) R 450	
5	Crown caps (if using crown cap bottles)	(for 100) R 75	
6	Capper (if using crown cap bottles) Notes: - Either a two-hand capper <u>or</u> a bench capper - Ask a fellow homebrewer to borrow one	R 250 - 750	
7	Bottling wand (bottle filler) Notes: - A short tube, which connects to the fermenter tap, with a push-valve at its bottom-end to allow the beer to run into the bottle only when pushed open against the bottom of the bottle	R 75	
8	Hydrometer & a 100ml measuring cylinder (or any tube-like container) Notes: - Although strictly speaking not essential you will need it if you want to determine the alcohol content of your beer - It is used to determine the specific gravity of your wort before fermentation, i.e. the Original Gravity (OG), and that of the beer after fermentation, i.e. the Final Gravity (FG) - the difference between these two readings is then used to calculate the alcohol content of your beer, expressed as the alcohol by volume (ABV) percentage - A measuring cylinder is used as not to waste too much wort/beer when floating the hydrometer at its required minimum depth	R 280	
	SUB-TOTAL EQUIPMENT COST	**±R 1 300**	

[1] Most homebrew shops also sell brewing starter kits at around R2000, which include all these items.
[2] Other common household equipment you'll need include: a kettle or pot for boiling water, a large plastic spoon or spatula for stirring, a 1-2L measuring/milk jug, a tin opener, and a pair of scissors. A spray bottle with sanitizer in will also be useful to sanitize tools and surfaces while you brew.

CONSUMABLES

Nr	Item	Approx cost	Notes
1	An extract brewing kit of your choice (including the malt extract and yeast)	R 300 - R600	- Cost varies depending on beer style, brand & supplier 

2	Optional, additional fermentables like dry malt extract (DME) or dextrose	R 100	- These are used to enhance your beer's flavour, body, alcohol content and/or colour 
3	Optional additional hops	R 85	- Should you want to dry hop (add hops to fermenter after primary fermentation) your beer - Cost varies depending on variety & supplier 
4	Water (municipal)	R 0.50	- Although Helderberg tap water is suitable for brewing, it is recommended that you filter it through activated carbon or let it rest in an open bucket for ±24h before use, to remove/dissipate the chlorine - Alternatively, you can use reverse osmosis (RO, i.e. bottled) water 
5	Sanitizer	R 90	- No-rinse, acidic sanitizers recommended - Should you want to use a chlorine-based sanitizer, e.g. Milton, dilute before use and rinse thoroughly with boiled water, as any residual chlorine will impart a strong off-flavour to your beer; NEVER use scented products 
6	Sugar for bottle conditioning	R 5	- Ordinary white sugar is perfect, but you could also use carbonation drops (small, purposely made sugar lumps) 
7	Gelatine (unflavoured)	R 30	- Used to clarify your beer after fermentation 
	SUB-TOTAL CONSUMABLE COST	**±R 580**	
	TOTAL COST	**±R 2 300**	**→ for first 50 bottles of beer (±R45/bottle); thereafter ±R11/bottle (consumables only)**

III. What to do

Malt extract brewing kits usually come with their own instructions. Compare these with the below advice and instructions and devise a plan best suited to your own system and personal preferences.

1. Cleaning and sanitizing your equipment

(a) Wash your fermenting bucket with dishwashing liquid and warm water.
(b) Rinse thoroughly with clean water.
(c) Prepare the sanitizer according to the manufacturer's instructions.
(d) Pour ±3L of diluted sanitizer into your fermenting bucket, throw your spoon and airlock in, replace the lid, then shake and rotate it to thoroughly wet all inside surfaces and the utensils. Run a small amount of sanitizer through the tap.
(e) Let stand for at least 5min (can stand longer if you are busy with other preparations).
(f) Repeat the shaking/rotation and leave for another 5min (again, can stand longer).
(g) Pour out the sanitizer and utensils into a beaker. Shake out as much of the foam as possible. Do NOT rinse with water if you have used non-rinse sanitizer. Replace the lid if you don't use it immediately.

IMPORTANT:
- Wort is a nutritional medium that will also sustain the growth of other microorganisms, like the wild yeasts and bacteria that surround us, which will spoil the wort. Sanitizing everything that will

come into contact with your wort, is therefore crucial to ensure your selected brewing yeast will be the only thing that grows in the wort.
- Pay careful attention to the sanitization process and how you handle everything that has been sanitized. Never touch the inside of your fermenter or lid, place the lid upside-down when you remove it, don't breathe into the fermenter, and don't use or add anything to the fermenter that has not been sanitized.

2. Wort preparation

(a) Remove the yeast from underneath the plastic lid of the malt extract tin.
(b) Stand the tin in hot water for ±10min to reduce the viscosity of the malt extract.
(c) Pour ±2L of hot (recently boiled) water into your sanitized fermenter, sanitize the outside of the tin and the tin opener, open the tin, and then add the malt extract to the hot water.
(d) Rinse the tin with hot water to transfer all the malt extract.
(e) Add any additional fermentables, e.g. dry malt extract, that you may be using, to the fermenter.
(f) Stir the mixture vigorously to dissolve all the components.
(g) Add cold (~room temperature) water up to the kit's indicated final volume – usually 23L – and stir again to ensure the wort is well-mixed.
(h) Check the wort's temperature to ensure it is between 18 and 30°C.
(i) Tap off the required amount of wort into a measuring cylinder and determine its OG – remember to write it down.
(j) Sanitize the outside of the yeast packet, cut it open with sanitized scissors, scatter the dry yeast on top of the wort and stir again well with your sanitized spoon.

3. Fermentation

(a) Seal the fermenter with its lid and connect the airlock – use diluted sanitizer in the airlock.
(b) Allow to ferment in a cool (18-26°C), dark place where the temperature is unlikely to fluctuate.
(c) If your fermenter seals well the airlock should start to bubble in 24-72h, depending on various factors, indicating that your yeast is happily growing and converting the sugars into alcohol and CO_2. – in other words, making beer! You should also notice a layer of foam on top of the wort, called the **krausen**, and smell a pleasant yeasty aroma.
(d) Fermentation should be finish (bubbling will stop) after ±5 days at ±25°C (it will take longer at lower temperatures). However, the only accurate way to confirm this, is to measure the FG. If it remains stable over a 24h period, close to the FG specified for the beer style, fermentation has finished.

(e) Calculate the ABV of your beer using the OG and FG readings in a calculator such as https://www.brewersfriend.com/abv-calculator/

WARNING:
- NEVER bottle beer before fermentation has finished. The remaining sugar in the wort plus priming sugar will result in the production of too much CO_2 that may cause the bottles to explode!

NOTES:
- Traditionally ales are fermented at 18-22°C and lagers between 10 and 16°C. Ferment at lower temperatures if your beer turns out too fruity. If you are unable to lower your fermentation temperatures (summer in South Africa) you may want to use a Kveik yeast strain (see resources).
- Arguably, the amount of yeast supplied with extract kits is on the low side, particularly if you increase your OG with DME or dextrose. Should you therefore detect yeast-related off-tastes in your beer you could buy and use addition yeast – in other words, increase your **pitching rate**.
- You may leave your beer in the fermenter for several weeks without any negative impacts, in fact, aging often improves the quality of a beer. If you can only brew on weekends, you can therefore brew on the first weekend and then bottle the next or even subsequent weekends.

4. Bottling and conditioning

(a) For the best results you should now clear your beer by adding **finings**, e.g. a teaspoon of gelatine dissolved in half a cup of boiling water, and leaving if for 24h. If possible, you can enhance this clearing effect by **cold crushing** your beer, i.e. cooling it down to 0-4°C for the 24h period.

(b) Clean and sanitize your bottles, caps, and bottling wand. Rinsing your bottles thoroughly in a tub of diluted sanitizer and then drying them upside-down in a bottle basket works well.

(c) Carefully, without disturbing the settled yeast cake, place your fermenter on a table with the tap protruding over the edge.

(d) Attach the bottling wand to the fermenter tap without touching part of the wand that will be stuck into the bottles.

(e) Open the tap and start filling the bottles one by one, sticking the wand deep into the bottle, opening the push valve with the bottle bottom.

(f) Fill each bottle right to the top – a small gap will be left in each bottle once the wand has been extracted.

(g) Fill around 10 bottles at a time, prime them with the desired amount of sugar and cap them before continuing with the next batch of 10. Working in batches like this reduces the amount of time the beer is exposed to air, thereby limiting oxidation. It also reduces the chance of spillage from accidentally knocking over open bottles.

NOTES:

- The exact amount of sugar to be added to each bottle depends on the size of the bottle and the desired carbonation level. It can be calculated using an online calculator like https://www.brewersfriend.com/beer-priming-calculator/.
- Two point four grams (2.4g) of table sugar in a 440ml bottle will give you 2.2 volumes of CO_2 - a generally suitable carbonation level for most beer styles.
- Rather use a volumetric spoon that gives you the correct amount of sugar with every scoop than trying to weigh of each bottle's sugar.
- Some brewers prefer to transfer the whole batch of beer to a secondary, sanitized container (also with a tap) to add the required sugar as a single amount, dissolve it, and then bottle the pre-primed beer.

(h) Store the capped bottles of beer in the dark at room temperature to allow them to condition/carbonate. The rate of this process depends on temperature and the beer's ABV and can take from a week to several months. Open a bottle after a week to test its carbonation level and repeat every 2-5 days if it is still too flat and sweet because of the unutilized sugar. Once your beer has been fully conditioned you can mature it in a cool, dark place.

(i) All that is left to do is transfer your beer to a fridge as required and to ENJOY it!

IV. Useful resources

1. Brewing your first Black Rock Kit (a general overview) https://www.youtube.com/watch?v=q88_chhw6g4
2. Using a blow-off tube for home fermentation https://www.youtube.com/watch?v=THxSS0BKAII
3. Hydrometer use https://www.youtube.com/watch?v=3nzlfcC-4jQ
4. Kveik Yeast Explained Easy Guide for Beer Brewers https://www.youtube.com/watch?v=0ttFQz_Eh5Q
5. Priming & Bottling Your Homebrew https://www.youtube.com/watch?v=x_vClg6RTP0