**BASIC INVESTMENT FOR MAKING QUALITY BEER**

A beginner in the home brewing space quickly faces a few difficult choices when it comes to investing in equipment. A minimal investment is required to brew a small batch of beer. However, certain steps in the brewing process must be performed precisely for the beer to turn out properly regardless of the equipment being used. All brewers must be able to combine and cook the required ingredients, steep grain at a controlled temperature, cool the wort rapidly, and ferment at a controlled temperature for a recipe to turn out as designed. Controlling the steeping temperature, cooling the wort, and controlling fermentation temperature is critical. It is primarily these factors that dictate the type of investment required.

A five-gallon batch of beer can be cooked in a kitchen with kitchen equipment using the extract method of brewing. Grain can be steeped in a large cooking pot, the wort can be cooled rather quickly in the sink using ice, and perhaps you can place your glass carboy fermenter in a closet or cellar that maintains constant temperature consistent with what the recipe calls for. If the recipe calls for a fermentation temperature that is different from the climate the carboy will be placed in, additional measures will have to be taken to control the temperature of the fermenter. Brewing an all grain recipe requires steeping and lautering the grain requiring an additional piece of equipment. An inexpensive modified cooler can be used for this process.

Brewing larger batches of beer rapidly becomes much more complicated and the required investment becomes more significant. At this point larger cooking vessels are required, special equipment is necessary to heat the larger vessels, temperature control becomes more difficult in the steeping process, cooling the wort quickly in a sterile environment becomes a significant challenge and fermentation space and climate control become challenging without specialized equipment. Perhaps Kegging becomes necessary or more practical than bottling, requiring additional equipment. At this point, the investment in equipment starts to increase significantly. As I indicated earlier, regardless of the amount of beer brewed by the novice or master brewer, certain elements of the process must be controlled or the recipe will not turn out as expected or could be a total loss.

A review of the equipment I used in my journey from a novice to advanced brewer, may be helpful. I started small with an initial investment of about $100 and now have a few thousand dollars of equipment. When I became interested in brewing beer, I wanted to try it out without spending a lot of money. I had to see if I could do it, and if I even liked it. I went to a local brewer’s supplier and purchased a kit that came complete with all the tools and ingredients I would need to make an extract batch of beer in my kitchen. If I recall correctly the basic kit was less than $100 and included an equipment kit consisting of a hydrometer, a plastic bucket with a spigot and lid, some tubing, an air lock, a glass carboy, a bottle capper with some lids and an ingredient kit including grain, malt extract, and a dry yeast packet. My first batch was ready to bottle in two weeks, it did not taste like the beer I bought in the store, but it was drinkable and I had fun brewing it.

I did this a few more times, some batches were Ok some were not, but I was challenged and enjoyed brewing. I read online brewing articles and purchased a few books on brewing and began to study and soon realized brewing was much more involved and complicated. I could see myself engaging in this hobby a little more seriously and was willing to try moving form extract brewing to all grain brewing which is the natural progression for beginners. Moving from extract brewing to all grain brewing was more complex and a required the purchase a few more pieces of equipment. My investment began to creep.

In one brew session I managed to melt the knobs on our kitchen stove, so my wife suggested all father brewing be done in the garage. Now I had to buy a propane cooker, and a larger pot to cook the all grain recipes. I also had to buy an ice chest to steep and lauter the grain. I built a brew sculpture out of wood that was gravity fed. I also purchased equipment and supplies to measure and control PH levels in the mash tun. I was now brewing beer every few weeks. I began to try different recipes and experiment with different hop varieties and various ingredients to change the taste of the beer. I joined a craft beer association, traveled to beer festivals and subscribed to brewers’ periodicals. When I traveled, I tasted every local craft beer I could learning about the local brewery the beer came from. I began to realize how little I really knew about beer or brewing. I was amazed, my interest was piqued, and I was definitely hooked on this hobby. I was now willing to upgrade my equipment and invest more substantially in this hobby with the goal of brewing excellent beer.

The next investment was substantial and the cost was in the thousands. To date I was brewing 5-gallon batches. Brewing a batch of beers takes several hours and so I wanted to brew larger batches less often. I bought a temperature controlled 10-gallon brew structure. The structure I purchased came with three stainless steel kettles. One kettle was a mash tun. for steeping the grain, the second was for heating sparge water, and the third was a boil kettle. The system had temperature control and a pump to move ingredients from one pot to the other and assist with temperature control. I also purchased a large 10-gallon stainless-steel conical fermenter with wheels. The conical shape was designed for harvesting yeast and removing trub without having to transfer the beer to another vessel reducing the risk of contamination. Additionally, I purchased a keg and the necessary equipment to pressurize the keg. These upgrades made the brewing process more efficient.

Despite the investment in the upgraded equipment, some of my beers were still not coming out like I expected them to. Frustration began to set in because some batches of beer were total losses. I did not know what was causing the issues resulting in this poor performance, but I had some suspicions. Attempting to minimize my investment in the hobby I was taking shortcuts with regard to rapidly cooling the wort, and controlling fermentation temperatures. I tried several different products to assist but with minimal effect.

At this point I signed up for a “Brewers Bootcamp” at a local brewery to observe and participate in a brewing session under the direction of the Brew Master. This class took the students over the course of three weekends from designing the beer we would brew all the way through to bottling. I had a chance to talk to the brew master in detail about my processes and learned a lot about what I was doing wrong. My suspicions were correct, controlling every element of the brewing process was mandatory, any deviation would change the outcome. The brew master explained that changing the fermentation temperature just a couple of degrees had a significant impact on the outcome of the beer. At this point I had to make additional investments to control the cooling of the wort and fermentation temperatures. I purchased a commercial refrigerator with temperature control that was large enough to place the 10-gallon stainless conical in. I purchased a counter flow wort chiller that cooled the wort in one third the amount of time it was taking me reducing the chance of contamination. I also purchased an oxygen stone and oxygen tank to infuse oxygen into the wort just prior to adding yeast. This is the only time the brewery exposes beer to oxygen. I purchased a second stone with a carbonating lid to infuse CO2 into the keg to carbonate the beer in minimal time and at the exact pressure I desired. Finally, I purchased a beer gun to fill bottles with carbonated beer from the keg so the beer was not exposed to the air and oxygen. I also learned how to test and control the PH levels in the mash and boil kettle.

At this point I had invested several thousand dollars into my brewing equipment. I am happy to report that I can now design recipes and brew them exactly as designed consistently. Every batch of beer brewed with this equipment provides me control over the process and batches come out well. I wasted a lot of time and money in my attempt to minimize expenditures on equipment and learned the hard way that it costs what it costs to brew beer. If I had it to do over, I would join a home brew club and participate in several brewing sessions to determine if I was interested and at the same time gain experience using the equipment. If I had done this, I would have purchased the brew sculpture, stainless conical and commercial refrigerator at the onset. It would have been a significant investment, but would have mastered the process very early on.

So, what is the basic investment necessary to brew quality craft beer? Enough to enable you to perform the brew steps precisely, controlling the process and temperatures called for in the beer recipe you are brewing. And, by the way, each recipe calls for a different set of temperature parameters in the brewing process. Research will help the beginner determine what types of equipment are required and how to use them.