

Mastering Dry Baking

There are three steps to mastering dry baking the FLAT CAT way. First, there is the proper setup of your stove, second is to understand the baking process and the third is patience. If you follow our guidelines you will find that dry baking is easy, fun and can open up a plethora of meals that you can make while out backpacking. We mainly discuss muffins and biscuits but we also bake lasagna, quiches, hamburgers and other exotic items. We break up the baking discussion into two parts: Solid fuels and alcohol. We will first be discussing baking with Esbit using the Epicurean stove. After that, we will discuss the steps for dry baking using our FLAT CAT Standard alcohol stove. Thick Aluminum pans will yield the best results, **NEVER USE A SILICONE BAKING CUP OR YOUR STOVE WILL OVERHEAT!**

Dry Baking with the Epicurean Stove (Esbit) (Bobcat & Snow Leopard Systems)

The Stove Setup - In setting up your stove, it helps to understand how the stove works. For baking, we want to produce a low temperature over a long period of time. Esbit, on its own wants to burn fast and furious. While this great for quickly boiling water; this is not a good mode for baking. To control the burn rate, two things need to be controlled: the amount of oxygen that feeds the flame and the ambient temperature around the solid fuel tablet. The amount of oxygen is set by the stove to pot gap. The ambient temperature around the tablet is extremely critical and is controlled primarily by the distance between the top of the solid fuel and the flame front; secondarily by the pot temperature. The Esbit fuel work by a sublimation process, external heat converts the solid fuel directly into a gas. In the Epicurean Stove, we limit the flame front to the top of the stove thereby limiting the burn rate. We do this by having the stove sit flush on the bottom of the baseplate and by having a high sidewall stove. In the Bobcat Cooking System, a single tablet of Esbit will burn for 50 – 60 minutes (in the simmer / bake mode). In the Snow Leopard Cooking System, a single tablet of Esbit will burn for 40 – 50 minutes



What does all of this mean to you? **Well, first, the base plate MUST be flat and the stove must be able to sit flat on top of the baseplate without any gaps.** A trickle of air coming in from the between the baseplate and the stove will heat up the tablet and make it burn faster and hotter. Secondly, you **MUST** control the height of the top of the Esbit tablet to the flame front. We do this by using a clean baseplate; all residual material must be removed. An easy way to help remove stubborn residuals is to add a few drops of alcohol to the soot and light it. After the flame extinguishes and the plate is cool, the soot can be easily removed. We also control the overall height of the fuel by using a single Esbit tablet at a time (embossed side up). If there is residual material on the base, it will cause the Esbit tablet to sit closer to the flames and this will cause it to burn faster. If you place the Esbit cube on its side, you raise the fuel closer to the flame and again, it will burn hotter. For consistent baking results, we recommend that you use fresh (unused) Esbit cubes. Partial cubes can be used if the total height of the stack is less than the height of a new cube (0.6" or 15 mm).

And what happens if I do not follow these steps? There is a high probability that the burn rate will increase until the flame front moves over the top of the stove and continues down the sides of the stove. This will cause the Esbit to rapidly burn and this may burn the handle and/or warp your cooking pot. It can get hot enough to melt an aluminum windscreen.

The Baking Process - When you are dry baking the FLAT CAT way, the vast majority of the heat goes into your baked goods through the walls of the pan and not with heated air. This is a fundamentally different way of baking than household ovens. When baking the FLAT CAT way, heat goes through the pot and transfers to the pan; there it transfers heat from your pan directly into your baked item. For this reason, we prefer to use a thick walled baking pan. In general, whatever touches the pan will be much browner and crustier than the exposed top. If you use a thinner walled pan, the heat transfer will not be as good and you are likely to burn the bottom and undercook the side. The rate of baking also depends on your pan size and the volume of food that you are baking. A 5" pan will require more time to bake than a 4" pan. Additionally, since the Snow Leopard can only fit a 3" by 3" pan, the volume of food is lower. The typical time for baking in the Snow Leopard system is 30 to 35 minutes. **Note: Always remove the pot from the flame when you are done baking. If you remove just the pan, the pot will get too hot and the stove will overheat (this is bad).**

When we bake, we oil the pan and use a disk of parchment paper on the bottom of the pan. When backpacking, we find that this is the simplest way to remove baked goods from your pan (and cleanup is pretty easy). Since cooking is accomplished through the walls of the pan, we do NOT recommend using parchment paper on the sidewalls. We find that this reduces heat transfer (therefore browning) of your goods. To enhance the baking process, we recommend using the FLAT CAT HAT. We found that by using the hat that the temperature between the pot and the pan were 5 F – 10 F warmer.

Patience – Baking the FLAT CAT way is a slow process. A vast majority of the baking occurs in the last 15 to 20 minutes of baking. When using a 4" pan, expect the baking time to be 45 minutes, for the 5" pan we usually let it go for 1 hour. Once the stove is lit, you do not need to interact with the process.

Dry Baking with the FLAT CAT Stove with the Bake & Simmer Ring (Bobcat System only)

The Stove Setup – To dry bake, you use the FLAT CAT Stove with the Bake & Simmer Ring. Alcohol stoves are extremely sensitive to thermal feedback from the pot. When dry baking, the pot temperature can get up to 350 F. These high temperatures have a negative impact on the stove so **the pot MUST be elevated to reduce the thermal feedback.** To accomplish this, take two tent stakes and thread them through the exit ports of the windscreen. This will elevate the pot by several inches and reduce the impact of thermal feedback. Note: never leave an empty pot over the stove as this can cause your pot to warp. Since the pot is elevated, it has less protection from the wind. Wind can cause the stove to burn faster and at the same time, move the flame away from the pot. We consider baking with an alcohol stove to be a “fair weather” option. With the Bake & Simmer Ring in place, we recommend that you fill the stove with less than an ounce of alcohol.



What happens if I don't elevate the pot? Well, the alcohol stove will be exposed to the high temperature of the pot. This will cause the alcohol vaporization rate to increase burning more fuel. This is called a positive feedback loop and the burn rate will increase thereby overheating the stove. This may burn the handle off, warp your pot and potentially melt your windscreen.

The Baking Process – The baking process is the same as that when baking with Esbit.

Patience – Baking the FLAT CAT way using alcohol is a little faster than when using the Esbit system. The biggest difference is that the fuel consumption with alcohol is much higher. A single tablet of Esbit can burn for 60 minutes while 1 ounce of alcohol will burn in about 35 minutes.