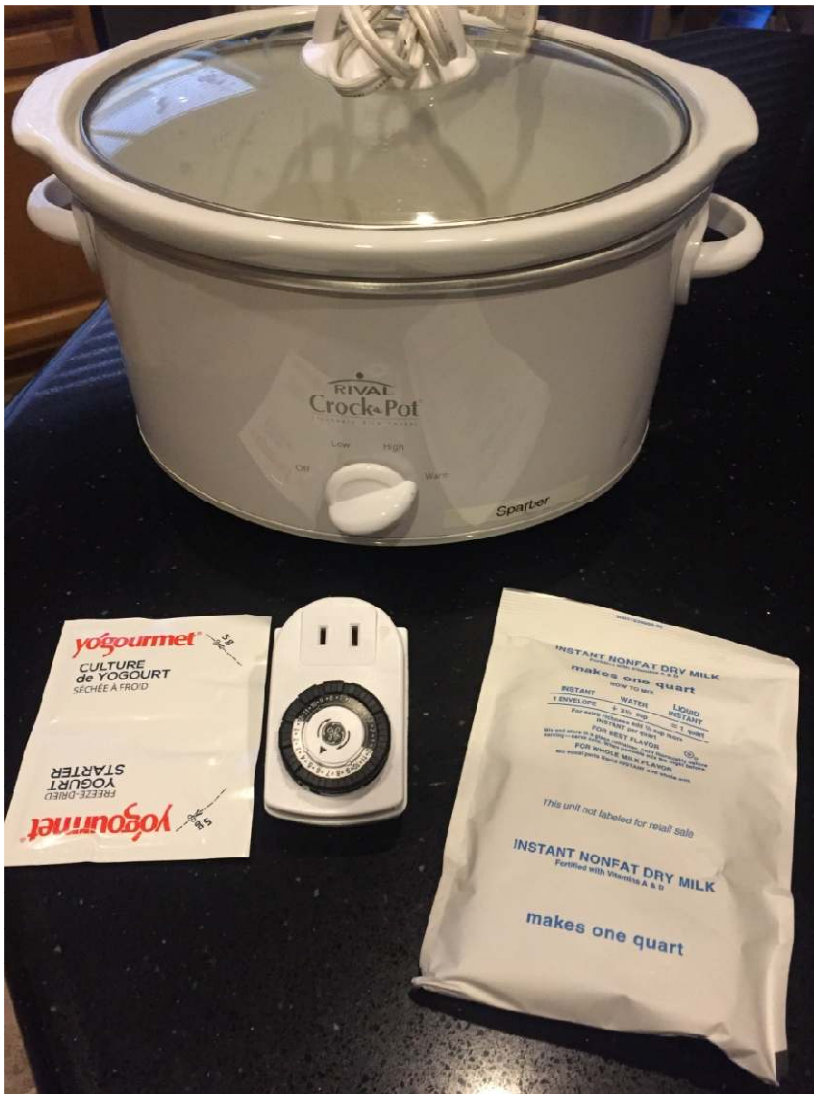


# Semi-Automatic Crockpot Yogurt, v 2.3

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I enjoy eating yogurt. I do not enjoy the high prices nor the wide array of fillers found in most brands.

One day I decided to try making my own yogurt. The best recipe I found involved a Crockpot and a thick towel to keep things warm during incubation. The results were not consistent. After a bit of thought, I decided to replace the towel with a common lamp timer. By turning on power for 30 minutes followed by 1 ½ hours of no power, I was able to maintain the proper temperature. After over 10 batches, I declare success! The yogurt is creamy with almost no water on top.

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<sup>1</sup> You are free to distribute this article but not to change it.

## Semi-Automatic Crockpot Yogurt

### Equipment

- 4 quart Crockpot with warm, low, and high settings
- 24 hour timer with the ability to set on/off every 30 minutes

### Timer Program (for 80°F room temperature)

- Noon up to 3 PM - ON (6 pegs)
- 3 PM up to 6 PM - OFF (6 pegs)
- 6 PM to 6 AM - start with them all OFF and then turn ON the first peg in each set (ON, OFF, OFF, OFF, ON, OFF, OFF, OFF, ...)
- If it has one, set the override switch to TIMER and not ON.

### Ingredients

- ½ gallon milk (I use skim)
- Freeze-dried yogurt starter (buy at Sprouts)
- 3.2 oz package of non-fat dry milk powder

### Procedure

- Start at noon
  - Verify timer is step up correctly.
  - Rotate the timer dial so the pointer is at noon.
  - Pour ½ gallon of milk in the Crockpot.
  - Put on the lid.
  - Plug the Crockpot into the timer and plug the timer into an outlet.
  - Set the Crockpot to **low**.
  - After a few minutes, feel the outside of the pot to verify it is heating.
- At 6 PM
  - Sprinkle in the yogurt starter and powdered milk while constantly stirring.
  - Put on the lid.
  - Set the Crockpot to **warm**.
- At 6 AM of the following day: your ½ gallon of yogurt is ready.

## An alternate view of the timer settings

This table is for a room temperature of 80°F.

<b>Time of Day</b>	<b>Pegs</b>
Noon up to 3:00 PM	6 pegs on
3:00 PM up to 6 PM	6 pegs off
6:00 PM	1 pegs on
6:30 up to 8:00 PM	3 peg off
8:00 PM	1 pegs on
8:30 PM up to 10:00 PM	3 peg off
10:00 PM	1 pegs on
10:30 PM up to Midnight	3 peg off
Midnight	1 pegs on
12:30 AM up to 2:00 AM	3 peg off
2:00 AM	1 pegs on
2:30 AM up to 4:00 AM	3 peg off
4:00 AM	1 pegs on
4:30 AM up to 6:00 AM	3 peg off
6:00 AM up to Noon	12 pegs off

If the room temperature is 70°F, the peg pattern from 6:00 PM to 6:00 AM is 1 pegs on on followed by 2 pegs off.

## What is going on here?

My Crockpot has 4 settings:

- Off
- Warm
- Low
- High

I filled the pot with water and set the switch on Warm for 3 hours. Then I measured 149°F. Next I turned the dial to Low, waited 3 hours, and read 164°F. And finally, I set the dial to High, waited 3 hours, and read 210°F.

The basic yogurt recipe called for heating the milk to around 150°F for 3 hours. Apparently going to 164°F is fine. Then it called for letting the milk cool for 3 hours. Rather than turning the dial to Off, I let the timer remove power for this interval. Then the yogurt starter is mixed in and the milk maintained at 95°F for 12 hours. This is where a little math and physics comes in. Most of the year, the room temperature in our kitchen is 80°F. If I run the Crockpot on Warm for  $\frac{1}{4}$  of the time and Off for  $\frac{3}{4}$  of the time, I will get

$$\text{Average temperature} = \frac{\text{Warm}}{4} + \frac{3 \times \text{room temperature}}{4}$$

$$\text{Average temperature} = \frac{149^{\circ}\text{F}}{4} + \frac{3 \times 80^{\circ}\text{F}}{4}$$

$$\text{Average temperature} = 97^{\circ}\text{F}$$

The ideal average temperature during this incubation period is 95°F. Close enough. I did have to play around with the pegs to find this ratio of on pegs to off pegs. Physics comes in because I am relying on the thermal inertia of the milk to average out the hot and cold intervals.

If your kitchen is at 70 °F, you can use a 3 peg sequence from 6 PM to 6 AM. One pegs on followed by 2 pegs off. This averages out to 96 °F. I have not tried this so please let me know if you have any problems.

Initially, I added the powdered milk along with the fresh milk. When I added the yogurt starter, I could see an orange ring at the milk line that was difficult to later clean off. By adding the powdered milk with the starter, there is no ring yet the resulting yogurt looks and tastes the same.

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