The Basics of Solar Cooking

Presented by Rose Marie Kern

Author of

The Solar Chef: A Southwestern Recipe Book for Solar Cooking

www.solarranch.com
Solar Cooking in History

- **700 BC – Sunlit Fires**
- We know that all the way back to the 7th century B.C., humans figured out how to make fires by concentrating the sunlight with magnifying glass.
Solar Cooking in History

1767 – Swiss Physicist Horace de Saussure
Created the first solar “hot box” cooker
The main types of solar cookers

- Box Style Cookers
- Parabolic
- Tube Style Cookers
- Lens cookers
Basic Principles of Solar Cooking

- Solar Cookers depend on the principles of Insulation and Insolation
- Use some method of capturing sunlight and converting it to heat.
Solar Box Cooker Uses

Baking
Boiling
Broiling
Slow Cooking
Emergency Cooking
Water Purification
Food Dehydration
Home Made Variations
Pizza Box Style Cookers
Various Home Made Cookers

Adobe box with glass lid
All American Sun Oven
The Ultimate Solar Cooking Appliance
Temps of 360-400 degrees F
What can you cook with a Solar Oven?

- Stuffed Bell Peppers
- Christmas Turkey
- Red Rice and Beans
- Breads, Soups, Stews
- Quiche
- Potato, Rice or Noodle Casseroles
- Corn on the Cob
- Pretty much anything!
Yes, You can solar cook in the winter.
Parabolic cookers focus and reflect sunlight at a point above the unit.

Great for frying.
Parabolics can be unstable in high winds.
Parabolic Design

- stove ring
- Supporting bar
- Adjustment handle
- Square Circles
- Helix lever
- Cross bearers
- Collector plates
- Tripod base
Some homemade Parabolic Cookers.
Parabolic Cookers capture the sun but do not have a container to retain the heat.

Glass bowl or black pot set inside common reflective materials like a car sunscreen.

Disadvantage – no insulation means quick cooling.
Parabolic Alternatives.

Pit lined with shiny metal and dark bottles on the bottom or a big Aluminum Bowl and black pot wrapped in heat resistant plastic.
Good in the snow.
Tube Solar Cooker

Good for broiling and frying.
Easy, fast and delicious, this fuel-free cooker can bake, boil or fry a meal for eight people, (4x more food than the speedier GoSun Sport) using only the Sun.

MEET THE GOSUN GRILL: A COMPLETE REDESIGN OF THE MODERN GRILL

- **No Monitoring Needed:** No burnt food, just set it and go
- **No Carbon Crud:** No dirty fuel makes transportation easy and cleanup a breeze
- **Delicious + Nutritious:** Cooking evenly and retaining your food's moisture, you will taste the difference
- **Goes Everywhere:** Deck, boat, park, beach or kitchen, simply fold the reflectors and go
- **Future Options:** GoSun is working on a suite of accessories/upgrades such as a Grill Stand and the ability to Cook at Night

**GoSun Grill**

$699

- Borosilicate Glass Vacuum Tube
- Quality Parts
- Mirrored Aluminum Panels
- Portable and Easy
- Temperature Up To 450 F
Fresnel Lens Cookers

Fresnel Lens is mounted and focuses light on pot behind it or…
Fresnel Lens Cookers

...Under it on a cooking surface!
Alternate Solar Cooker/dehydrator
Solar Cooking can be a community experience!
The Solar Villager can cook

- 8 Turkeys
- or
- 6 trays of cookies
- or
- 40 Ears of Corn
- or
- 20 loaves of bread at a time!
Advantages of using Solar to cook.

- Keeps your house cooler in summer
- Does not use electricity or gas
- Saves money
- When emergencies take out all power, you can still have a hot meal.
- Food tastes Fantastic!
Can be used when camping when campfires or even propane campstoves are not allowed by the forest service.
- Know your cooking location, choose a place where shadows will not fall on the oven.

- When placing the oven, know where the sun comes up, where it is at noon, and where it will descend.

- Expect cook time to be 30% longer than in a convection oven.
Sun angles are best from late April through mid October. On June 21\textsuperscript{st} the sun’s path reaches 33 degrees North Latitude.

Albuquerque sits at 35 degrees north latitude.

Summer Sun versus Winter Sun
A large High pressure over and to the west usually indicates long periods of dry conditions.
The onset of Monsoon season is when there is a strong Low over the Baja and a strong High over the Gulf of Mexico.
Tilt box towards the sun

Spin box to follow sun to keep temperatures high. Adjust every half hour for baked goods and eggs.
When slow cooking aim the oven at where you think the sun will be in an hour...then walk away for the next four hours.

This is a good practice for roasts, soups, stews, beans, rice and casseroles.
Solar Cooking
Requires that
You pay attention
To Mother Nature!

ESPECIALLY
CLOUDS AND WIND
## Albuquerque, NM 5 Day Weather

<table>
<thead>
<tr>
<th>DAY</th>
<th>DESCRIPTION</th>
<th>HIGH / LOW</th>
<th>PRECIP</th>
<th>WIND</th>
</tr>
</thead>
<tbody>
<tr>
<td>TODAY</td>
<td>Partly Cloudy</td>
<td>97/69°</td>
<td>20%</td>
<td>SSE 8 mph</td>
</tr>
<tr>
<td>JUL 11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRI</td>
<td>Mostly Sunny</td>
<td>96/71°</td>
<td>10%</td>
<td>SSE 9 mph</td>
</tr>
<tr>
<td>JUL 12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAT</td>
<td>Partly Cloudy</td>
<td>95/69°</td>
<td>20%</td>
<td>SE 9 mph</td>
</tr>
<tr>
<td>JUL 13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUN</td>
<td>Partly Cloudy</td>
<td>95/70°</td>
<td>20%</td>
<td>SW 8 mph</td>
</tr>
<tr>
<td>JUL 14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MON</td>
<td>Mostly Sunny</td>
<td>97/71°</td>
<td>10%</td>
<td>NNW 7 mph</td>
</tr>
<tr>
<td>JUL 15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Albuquerque, NM Hourly Weather

**11:26 am MDT**

<table>
<thead>
<tr>
<th>TIME</th>
<th>DESCRIPTION</th>
<th>TEMP</th>
<th>FEELS</th>
<th>PRECIP</th>
<th>HUMIDITY</th>
<th>WIND</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:45 AM THU</td>
<td>Partly Cloudy</td>
<td>91°</td>
<td>91°</td>
<td>15%</td>
<td>28%</td>
<td>S 7 mph</td>
</tr>
<tr>
<td>12:00 PM THU</td>
<td>Partly Cloudy</td>
<td>92°</td>
<td>92°</td>
<td>15%</td>
<td>27%</td>
<td>SSW 7 mph</td>
</tr>
<tr>
<td>1:00 PM THU</td>
<td>Partly Cloudy</td>
<td>94°</td>
<td>94°</td>
<td>15%</td>
<td>22%</td>
<td>SSW 7 mph</td>
</tr>
<tr>
<td>2:00 PM THU</td>
<td>Partly Cloudy</td>
<td>96°</td>
<td>96°</td>
<td>15%</td>
<td>18%</td>
<td>S 7 mph</td>
</tr>
<tr>
<td>3:00 PM THU</td>
<td>Partly Cloudy</td>
<td>94°</td>
<td>94°</td>
<td>15%</td>
<td>18%</td>
<td>SSE 4 mph</td>
</tr>
<tr>
<td>4:00 PM THU</td>
<td>Partly Cloudy</td>
<td>93°</td>
<td>93°</td>
<td>15%</td>
<td>19%</td>
<td>SE 9 mph</td>
</tr>
<tr>
<td>5:00 PM THU</td>
<td>Partly Cloudy</td>
<td>94°</td>
<td>94°</td>
<td>15%</td>
<td>19%</td>
<td>ESE 8 mph</td>
</tr>
<tr>
<td>6:00 PM THU</td>
<td>Partly Cloudy</td>
<td>93°</td>
<td>93°</td>
<td>15%</td>
<td>18%</td>
<td>E 9 mph</td>
</tr>
<tr>
<td>7:00 PM THU</td>
<td>Partly Cloudy</td>
<td>90°</td>
<td>90°</td>
<td>15%</td>
<td>21%</td>
<td>E 11 mph</td>
</tr>
</tbody>
</table>
FEW

SCT
Solar Cooking is still possible with a few clouds or a thin overcast cirrus layer – but stick to foods that need lower temperatures.
Best dishes for cooking in a Box Cooker

- Thin Black metal covered pots
- Clear Casserole Dishes
- Dark Pottery Dishes
- Dark metal baking dishes
- Do not use white casserole dishes
- Cast Iron? Not really. Too heavy
- and only use aluminum if food is covering most of the surface. Will reflect sunlight back out.
All American Sun Oven
The Ultimate Solar Cooking Appliance
Temps of 360-400 degrees F
The All American Sun Oven has built-in thermometer, 2 inches of insulation, a aiming device, heat tempered glass and folds up into a convenient carrying case weighing only 23 pounds.
Casserole dishes can be stacked.

Dark Clay pots retain heat well.
General Information

- Best Cooking Times
  - Winter 10am to 4pm
  - Summer 8am to 6pm
  - Preheat the oven for half an hour prior to cooking
  - When using recipes written for convection ovens add 30% longer cooking times
Hints and Tips

- Use a roasting bag inside your pot for baking meats and turkeys.
- Ove-Gloves work best when lifting the glass lids and removing hot cookware.
- Treat the inside of the tempered glass with **Rain-x** to keep humidity from fogging the glass and lowering the temperature.
- Tuck baking potatoes inside clean black socks and set around other dishes in oven.
Sun Oven Drying

While perfect for solar cooking, a sun oven requires a lot of attention to keep it from overheating while drying. This is one time when you do NOT point the oven directly at the sun!

Sun Ovens are best for jerky because the temperature can get high enough to kill all the bacteria.

They also work for larger, juicier fruits or vegetables requiring drying times which may take days.

While actively drying, the glass lid is propped open to expel moisture. Close it at night to protect the food until the next day.
Dehydrate in partial shade with the glass open ¼ inch.
Fruits/Vegetables suitable for drying

Dry Veggies and Fruit between 120-150°F

Apples  Coconuts  Peaches
Apricots  Horseradish  Parsley
Beets  Celery  Pears
Carrots  Mushrooms  Peas
Bananas  Figs & Dates  Pineapples
Sweet Corn  Okra  Peppers
Cherries  Onions  Plums
Garlic  Nectarines  Potatoes
Grapes  Parsnips  Pumpkins

Tomatoes
Good book about Building Solar Cookers
How to cook with solar and which has a wide variety of recipes

Available today for $12.00
All American Sun Oven
Manufacturer Price $349.00

▶ Check online for discounted price at www.solarranch.com

Free copy of The Solar Chef with oven purchase.
The Basics of Solar Cooking

Presented by Rose Marie Kern

LET's EAT!