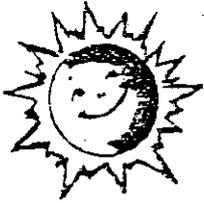


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SOLAR COOKING

by Priscilla J. Mays and Dianna Nurczyk
Maricopa County Extension Agents, Home Economics

The southwest is a natural place to use solar cooking. Food that can be cooked in a conventional oven can also be cooked in a solar oven at the same temperatures.

A concern with solar cookery is food safety. The solar cooker must be preheated prior to each use. It is important to maintain adequate temperatures during the cooking process.

There are a variety of solar cookers in use today. These hints relate to all solar cookers.

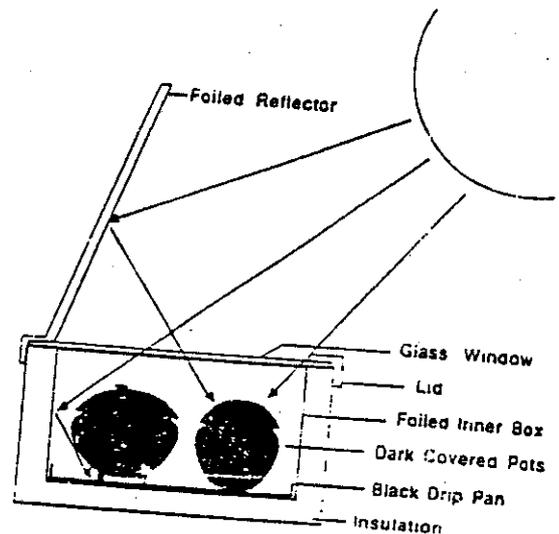
- 1) Use a solar oven that will reach and maintain average oven temperature of at least 250 degrees F. The amount of insulation or reflective ability influence the temperature reached in the oven.
- 2) Preheat the oven to the temperature needed to cook the food. The temperature will probably drop 25-50° when you put the food in the oven and will rise again slowly.
- 3) Turn the oven and adjust reflectors to concentrate maximum solar radiation; preferably, you should refocus at least once every hour during the cooking process.
- 4) Consider weather conditions when cooking with solar ovens.
- 5) Be sure food is properly protected from insects, soil, and wind.
- 6) Any kind of cookware can be used. However, dark, light-weight cookware heats up faster.
- 7) Always preheat the solar oven before cooking.
- 8) Use a thermometer in the oven to be sure it maintains the correct temperature.
- 9) Use all the sanitary principles recommended for any food preparation.
- 10) Most recipes used in conventional ovens can be used in the solar oven. However it may take longer to cook.

HOW TO BUILD AND USE A SOLAR BOX COOKER

- I. OVERVIEW
- II. MATERIALS NEEDED TO BUILD
- III. HOW TO BUILD
- IV. TIPS FOR COOKING AND BAKING
- V. HOW TO JOIN THE SOLAR BOX COOKERS INTERNATIONAL NETWORK

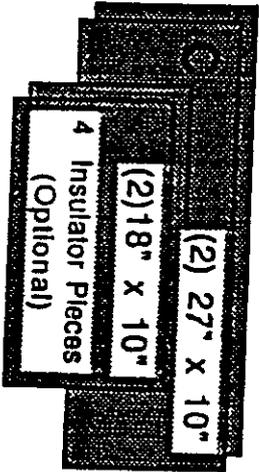
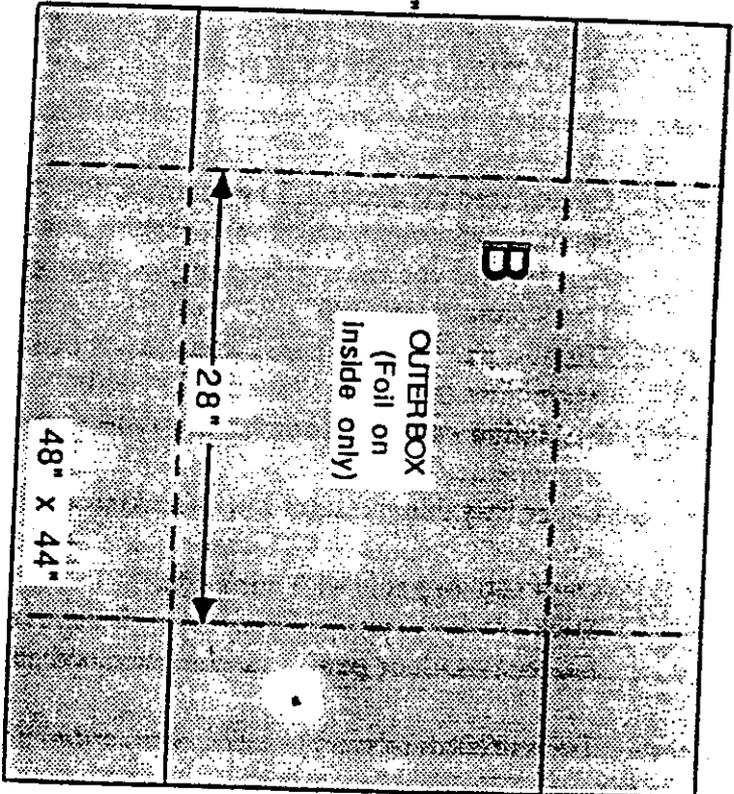
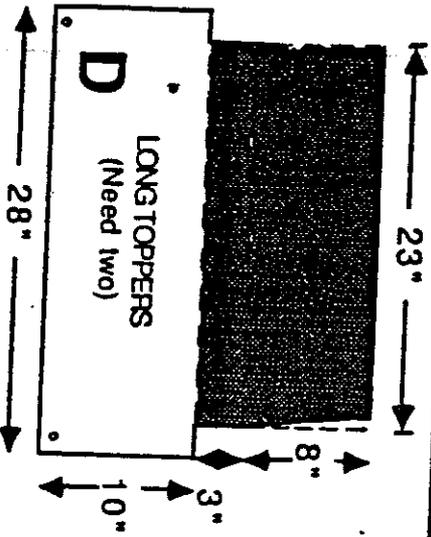
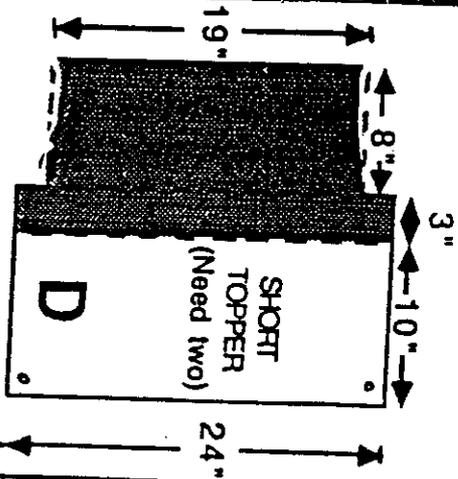
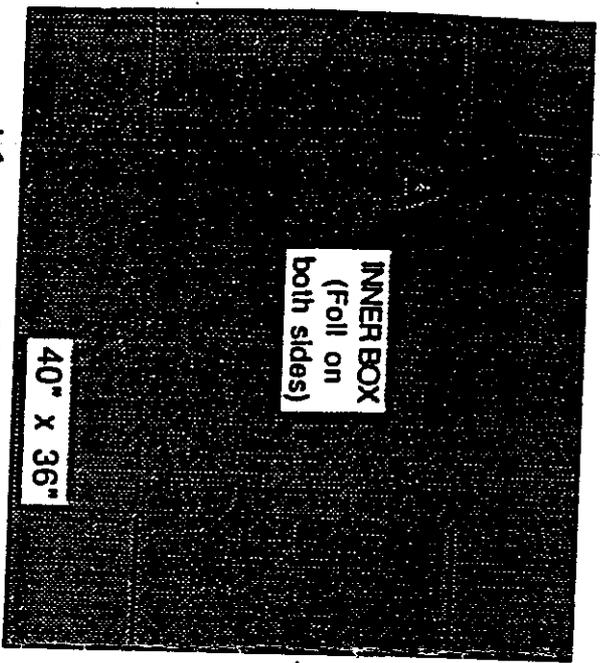
I. OVERVIEW: These instructions will make a solar box which cooks 10-15 lbs. of food on sunny days. Larger, deeper cookers will cook more food and hold larger pots. A solar box cooker is

- A. a large inner box covered with aluminum foil on both sides
- B. a larger outer box foiled one side only
- C. insulation between boxes
- D. toppers to seal space between boxes.
- E. A tight-fitting lid with a glass window to let in sunlight and hold heat inside. As part of the lid a shiny flap, a reflector is propped up to bounce more sunlight into the box. When not in use it closes to cover and protect the glass.
- F. a prop to hold up reflector.
- G. Inside the box, heat from sunlight is absorbed by a black metal tray at the bottom and by
- H. dark covered pots which heat and cook the food.



II. MATERIALS NEEDED: Those used for the inner box and insulation must withstand high temperatures, be non-toxic, and not conduct heat readily (as metal does).

- Corrugated cardboard: 2 large boxes, 19" x 23" x 8 1/2" and 24" x 28" x 10". (or cardboard to make them) and several extra pieces. (see p.2) If you don't have enough big cardboard pieces you can overlap and glue together smaller pieces.
- Glass pane at least (20" x 24") and slightly larger than inner box.
- Glue - a pint of water-based whiteglue or carpenter's glue.
- Aluminum foil - about 75 feet x 12" wide
- Insulation - crumpled newspaper or clean, dry straw, rice hulls, etc. Must withstand high temperatures.
- Large tray thin metal (or foil covered piece of cardboard) for inside bottom. Paint top side with black tempura or high-temperature black paint.
- Dark cooking pots with dark lids.
- Stick or wire to prop reflector; also string or cord.
- Silicone caulk or papier mache (shredded paper soaked in water, mixed with glue).
- Tools needed: scissors or knife; bowl or flat pan to mix glue, brush or roller to spread glue.

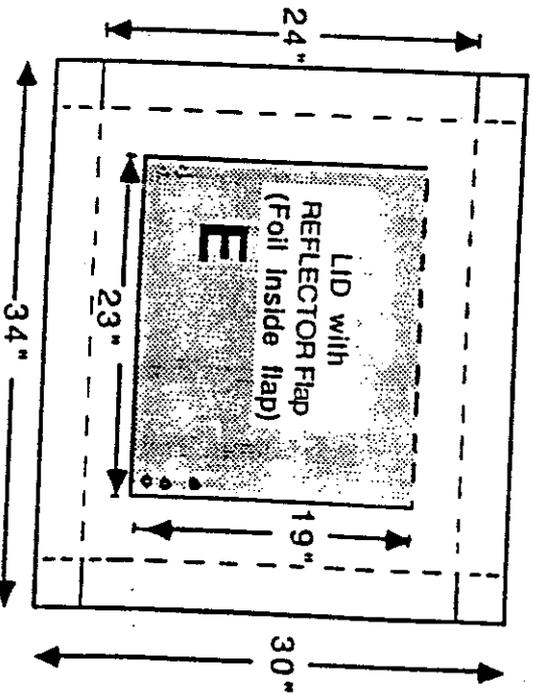


Cardboard Pieces for Solar Box

— Cull - - - - - Fold

▨ Foil one side ▩ Foil both sides

SCALE = 1/12



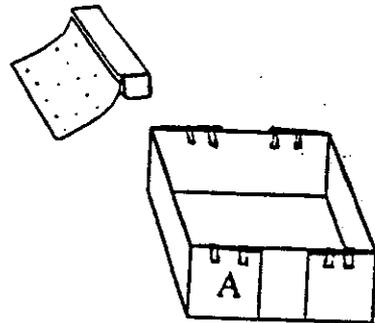
III. HOW TO BUILD YOUR SOLAR BOX COOKER

Glue foil thoroughly to toppers and reflector flap, to withstand wear and tear, using a mix of half glue and half water. On other pieces, foil can be just wrapped, taped, or spot-glued. Put shiny side out, and overlap foil edges slightly.

A. THE INNER BOX - Foiled both sides. Size is important; boxes smaller than those described will only cook small amounts of food, because they won't get enough solar energy.

Start with a box that is 19" x 23" x 8 1/2" or proportionally bigger. Cover any holes with cardboard patches, then cover BOTH sides with foil.

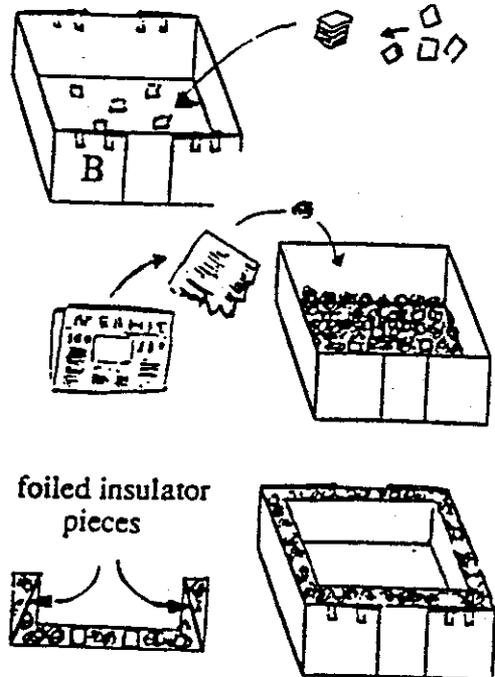
To make a box from flat cardboard box, see p.2 "inner box". It is easier to glue aluminum foil onto both sides after making creases for the folds but before shaping into a box. For straight folds, bend against some sharp, straight edge. Then, form the box using masking tape or full-strength glue, using clothes pins or weights to hold until glue is dry.



B. THE OUTER BOX - Foiled inside only. 24" x 28" x 10" or larger. It needs to be bigger than the inside box so that there is about 2 1/2" space between all four sides of the two boxes, and 1" + between bottoms. The outer box can be of material other than cardboard (such as wood). To build a box see "outer box", p.2.

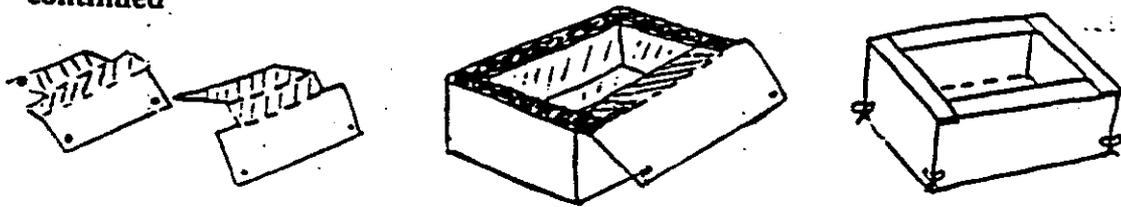
C. SUPPORTS AND INSULATION
First glue or tape small stacks of 2" cardboard squares to make 8 supports in bottom of outer box. Fill rest of bottom with small balls of newspaper or other insulation material. Then, place inner box so that there is 2 1/2" space between the two boxes, on each side.

There are many ways to insulate the sides. Crumpling newspaper is one way; a little crumpled newspaper with four foiled insulator pieces (see p.2) is even better. The bottom of each insulator piece is against outside box, and the top is against inner box, with crumpled newspaper in the spaces. Other clean, dry materials may be used, such as wool, straw, rice hulls. For hotter box add foiled layers. While cooking, a well-insulated cooker should not feel hot on the outside, except the glass.



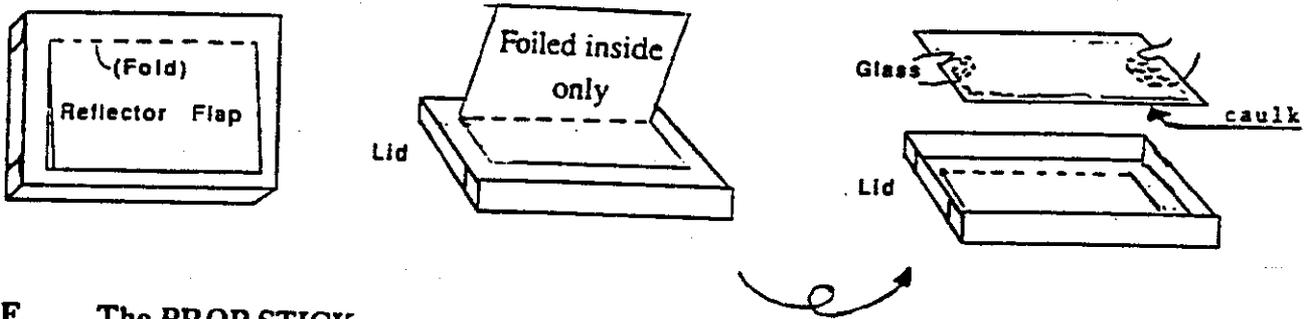
D. SEALING THE SPACE BETWEEN THE BOXES WITH TOPPERS: When all insulation is in you must thoroughly seal the top space between the two boxes with 4 cardboard toppers (see p.2). The two short and two long toppers are foiled on both sides just to outside fold.

D. continued



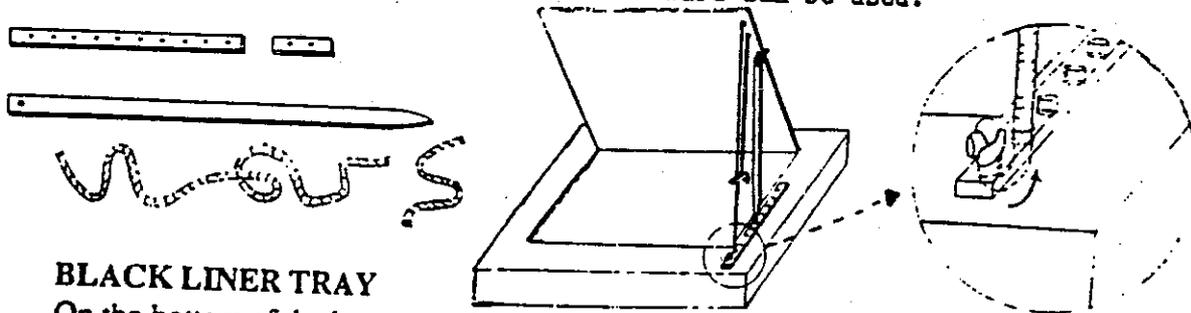
The four toppers fold to cover both the inside of the inner box and the outer side of the outer box. If you tie the toppers at the 4 outside corners of the cooker you will be able to take your cooker apart again for teaching or demonstrating to others. If you plan to use your cooker only for cooking, toppers can be glued in permanently.

E. The LID with REFLECTOR FLAP can be made several ways, but must provide a snug-fitting seal. After a basic lid is made, cut three sides of an opening that will frame the glass "window". Fold back the flap created from the 3 cuts and foil its inside surface to make the reflector. Put silicone caulk or papier mache around edge of glass on one side. Then press glass onto inside of lid so that there is a complete seal all around.



F. The PROP STICK

This shows just one way to prop up the reflector flap to reflect sunlight into the box. The pointed stick is tied to the flap and its free end is set in one of the holes in a stick glued to the lid. The string, which is anchored to the lid, then looped through the corner of the flap and back to the little stick, is tightened to hold the flap. A simpler prop can be made by notching a stick at both ends and tying with strings, or stiff wire can be used.



G. BLACK LINER TRAY

On the bottom of the inner box place a black thin metal tray. It catches spills and also draws heat to the cooking pots. A cardboard piece covered with aluminum foil painted black will work.

H. DARK COOKING POTS WITH LIDS

It is important to use dark pots with dark, tight-fitting lids. Metal, black enamelware, ceramic, or brown glassware work well.

The final step before cooking food for the first time in your new solar box cooker is to let it heat empty in the sun for several hours to be sure all paint and glue is dry and won't give off fumes.

IV. TIPS FOR COOKING AND BAKING WITH A SOLAR BOX COOKER

1. **GET IT ON EARLY, DON'T WORRY ABOUT STIRRING, BURNING OR OVERCOOKING.** The cooker works best when the sun is high in the sky.* It is hard to overcook foods; you don't have to be around when they are ready to eat. Several hours more in the cooker won't hurt most foods; meats just get more tender. Foods won't burn, so there is no need to stir or check on them until you are ready to eat. Also you can close the reflector flap on the glass and put a blanket over the cooker to keep food hot longer. Foods will cook if there is at least 15 minutes of sunshine each hour.

* Daily all year in tropics; 6 warmest months in temperate zones

2. HOW MUCH WATER TO ADD?

The normal amount of water is added to dried foods such as beans, rice, maize, quinoa, millet. No water is added to fresh meat, fish, chicken or fresh fruits and vegetables such as potatoes, beets, carrots, squash, yams, apples. They cook in their own juices, making them even more flavorful.

3. HOW MUCH TIME WILL IT TAKE TO COOK?

This will vary with the total amount of food (more food will take longer to cook), types of pots used, the amount of sunshine available (whether it is partly cloudy), and the types of food.

EASY-TO-COOK FOODS

In good sun - 2 hours

white rice
chicken
fish
most fresh vegetables
millet
quinoa
barley
cakes

MEDIUM-TO-COOK FOODS

3 hours

maize
brown rice
potatoes
lentils
beans (blackeyed)
apples
baking bread

HARD-TO-COOK FOODS

4-5 hours

dried beans
(red, pinto,
kidney, black)

dried split peas
large meat roasts

4. NEED TO MOVE THE BOX TO FOLLOW THE SUN? No, unless:

- the day is more than half cloudy or
- the sun is at a lower angle (higher latitudes, winter months) or
- you want hotter temperature - for baking, for example or
- for cooking a larger quantity of food.

Usually you just face the cooker so that halfway through the cooking time the cooker will be facing the sun most directly.

5. REMEMBER - POTS INSIDE THE COOKER GET HOT. USE POTHOLDERS. And when lifting lid, be careful of hot steam.

6. **DON'T LEAVE COOKER OUT IN THE RAIN. COVER IT WITH A TARP OR MOVE IT INSIDE.** If your cooker gets wet inside or out let it dry ... with the lid off. After cooking, wipe moisture off inside of glass and/or leave lid off so inside of box dries out.

Some people paint the outside box if it is cardboard, or cover it with contact paper to protect it. Cardboard solar box cookers have been known to last ten years and more. As long as any holes are sealed and you from time to time patch torn places in the aluminum foil your cooker should serve you for many years.

V. JOIN THE SOLAR BOX COOKERS INTERNATIONAL NETWORK

Solar box cooking has been used regularly for over ten years in several parts of the world, and new uses are still being discovered. Try everything, and let us know what you learn so that we can share new discoveries with others around the world. Please tell us problems you encounter and how you solved them if you did, so we can share that knowledge.

You can also help us spread information about solar box cooking to millions of people in sunrich parts of the world who now spend countless hours gathering scarce wood for cooking fuel. Please join SOLAR BOX COOKERS INTERNATIONAL with a tax deductible donation.
THANKS!

5/89

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Recipes Used at
Town & Country '86
Open House

ESCALLOPED CARROTS
(Serves 6)

| | | |
|--|--------------------------|-----------------------------|
| 10 medium size carrots pared & sliced | 2 tablespoons margarine | 1/8 teaspoon celery salt |
| 1 medium onion, chopped | 1/2 teaspoon salt | 1 cup milk |
| 3 tablespoons flour | 1/4 teaspoon dry mustard | 6 oz. sliced cheddar cheese |
| | 1/8 teaspoon pepper | 3 tablespoons bread crumbs |

Cook carrots until slightly tender and drain off any excess liquid. Saute' onion in margarine 2 or 3 minutes. Stir in flour, salt, dry mustard, pepper, and celery salt; then blend in milk and cook, stirring until smooth. (1/4 cup of the excess liquid can be added to this sauce for extra flavor and nutrients.) In a one quart casserole, arrange layers of carrots and layers of cheese. Repeat until it is all used up. Pour sauce over all. Sprinkle with crumbs and bake at 350°F for 25 minutes. This casserole provides Vitamin A and calcium.

Zucchini Bread
(Makes 2 loaves)

| | | |
|-------------------------|------------------------|----------------------------|
| 1 cup sugar | 1 cup salad oil | 1 tablespoon cinnamon |
| 1 cup brown sugar | 1 tablespoon vanilla | 1 teaspoon salt |
| 3 eggs | 3 cups flour | 1/4 teaspoon baking powder |
| 2 cups zucchini, grated | 1 teaspoon baking soda | 1/2 cup chopped nuts |

Combine the first six ingredients and mix well. Combine the dry ingredients and add to the first mixture. Stir just until flour is blended. Bake in two greased bread pans at 350°F for 50 to 60 minutes. Cool 10 minutes before removing from pans. This bread will provide some protein, Vitamin C and Vitamin A.

Caramel-Nut Crispies
(Makes 4 1/2 dozen)

| | |
|-------------------------------------|-----------------------|
| 1 3/4 cups sifted all-purpose flour | 1/2 teaspoon salt |
| 1/4 teaspoon baking soda | 3/4 cup margarine |
| 1 cup brown sugar, packed | 1/2 cup nuts, chopped |
| 1 teaspoon vanilla | |

Preheat oven to 400°F. Sift together flour, salt and baking soda. Melt margarine in saucepan over low heat, cool to lukewarm, stir in brown sugar, nuts and vanilla. Add the dry ingredients and mix thoroughly.

Divide the dough in half, shape into two rolls 8 inches long. Wrap in waxed paper or aluminum foil, chill at least one hour. Cut into 1/8 inch slices; place on ungreased baking sheets. Bake about 5-8 minutes until delicately browned. Cool for one minute, and remove from baking sheet. This dessert cookie is high in fat and carbohydrate with a small amount of protein.

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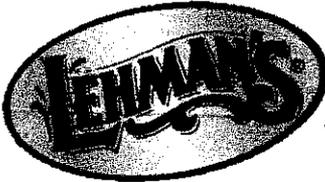
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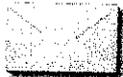
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Deluxe Sun Oven



Deluxe Sun Oven

-
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Previous Product | Next Product

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Lehman's

Located in downtown Kidron, Ohio, Lehman's is the place where being old-fashioned is always in fashion, right down to the sixty-five foot buggy hitching post across the street from the store. Founded in 1955 by Jay Lehman to serve the local Amish, today Lehman's is one of the world's largest purveyors of new old products, shipping merchandise to over 200 countries.

In fact, Lehman's is so well-known for their extensive collection of practical, historically accurate hand tools, toys, non-electric appliances, kitchenware, oil lamps, and water pumps, that they are often called upon by Hollywood set designers to provide authentic products for period pieces. Big pictures such as "Cold Mountain" with Nicole Kidman; "The Debators" with Denzel Washington; "Open Range" with Kevin Costner; and "Pirates of the Caribbean" with Johnny Depp all turned to Lehman's for the perfect set dressing.

A recent expansion more than doubled the size of their store, including the reconstruction of an 1840's era barn. The expansion added a high tech demonstration room - formerly a buggy barn on an Amish farm - a cafe, indoor and outdoor seating, expanded displays and interactive demonstration areas. So take a trip to the past... you'll be sure to find the perfect present. Whether you're looking for the tools to live the simple life yourself, or want an unforgettable souvenir of your trip to Amish country... you'll find it all at Lehman's, on the square in Kidron.

Lehman's

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