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JUN 2 1978

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**FOOD SCIENCE AND NUTRITION
FACT SHEET No. 29—Revised 1978
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Homemade Yogurt

Yogurt can be a delicious way to enjoy milk. It contains milk nutrients yet has a flavor that can be adjusted to individual tastes. This milk product is very popular in Europe and is gaining popularity in the United States. Metchnikoff, a famous Russian-born French scientist, attributed the long life of some Eastern Europeans to daily consumption of large amounts of yogurt. While it is not possible to guarantee long life simply by eating yogurt, it is one home project that can be fun to make and eat.

Yogurt is made by fermentating the sugar of milk (lactose) to lactic acid through the action of certain bacteria usually *Streptococcus thermophilis* and *Lactobacillus bulgaricus*. The milk that is used contains higher solids than normal milk. The solid content of milk is increased by adding nonfat dry milk (NFDM), evaporated milk, or by boiling milk to remove some of the water. The easiest at-home method would be adding NFDM to milk.

After the milk has been mixed, heated, and cooled, the fermentation is started by adding a culture of the 2 microorganisms to the milk at a temperature of 110° F. This temperature is maintained (110° F. ± 5°) for 3-4 hours until a firm coagulation has developed. When the yogurt is ready it should be cooled immediately and kept cold until consumed. Yogurt can be eaten plain, mixed with fresh or sugared fruit, used in cooking and in salads.

Starter culture

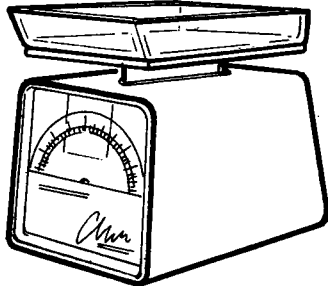
Dry cultures for making yogurt can be purchased in some health food stores, but they are usually expensive. Follow directions obtained with dry culture to start it growing. Dried cultures may also be purchased directly from the manufacturer. The easiest and least expensive way of obtaining a starter culture is to purchase plain yogurt at a grocery store. It must be plain—no fruit or sugar added. This provides a starter culture.

After the first batch of yogurt has been made, a portion of your home-made yogurt may be kept to be used as a starter culture for the next batch.

Note on powdered skim milk

Powdered milk or nonfat dry milk (NFDM) will vary in its bulk density, that is, the ratio of volume to weight. The recipes in this fact sheet have been developed to give approxi-

mately 15 percent total milk solids on a weight basis. Ideally, the milk powder should be weighed to obtain the desired solids content. Since this might not be possible in all home kitchens, approximate cup measurements are also given. If the yogurt is too thick, then reduce the amount of powdered skim milk added, if it is too thin add more powdered milk.

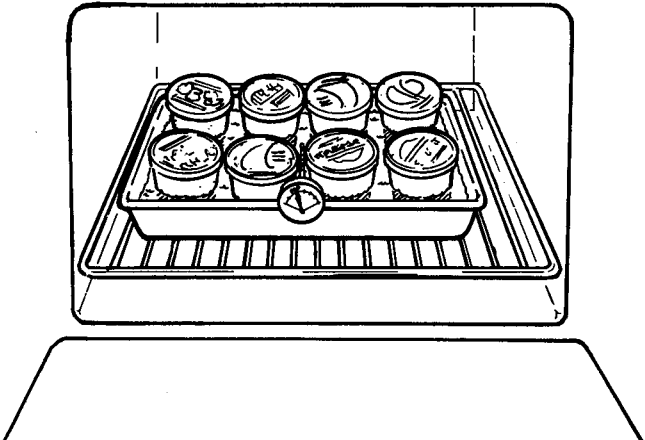


In the following recipes the amount of NFDM to add is given 3 ways: ounces, cups of instant NFDM, or cups of regular NFDM. Use only one of the three measures given.

Equipment

- A 4 or 5 quart saucepan
- Thermometer **, preferably stainless steel, temperature range 50-220° F. (a glass thermometer can be used but breaks easily)
- Containers for yogurt
 - 8, pint jars or plastic containers or 16, ½-pint jars or plastic containers with covers
- Setting pans to hold water for yogurt containers to be incubated

** Good stainless steel thermometers are available from Weston Instruments, Inc., 614 Frelinghuysen Ave., Newark, N.J. 07114 Model 2292, Temperature range 0-220° F. Approximate cost: \$12.



Ingredients

Recipe 1—Yogurt using only nonfat dry milk

- 21.6 oz. NFDM
 - or 8 1/3 cups instant NFDM
 - or 4 3/4 cups regular NFDM†
- 1 gallon water at 110° F.

Recipe 2—Yogurt using skim milk and NFDM

- 1 gallon skim milk
- 10.4 oz. NFDM
 - or 4 cups instant NFDM
 - or 2 1/4 cups regular NFDM

Recipe 3—Yogurt using 2% milk and NFDM

- 1 gallon 2% milk
- 7.2 oz. NFDM
 - or 2 3/4 cups instant NFDM
 - or 1 1/2 cups regular NFDM

Recipe 4—Yogurt using regular milk

- 1 gallon regular milk
- 4.8 oz. NFDM
 - or 1 3/4 cups instant NFDM
 - or 1 cup regular NFDM

Method for making yogurt

1. Heat the milk in saucepan or double boiler to 180°F and maintain this temperature for 15-20 minutes. This step is necessary to kill any undesirable bacteria that might be present and also changes the properties of the milk protein that gives yogurt a firmer more custard-like body and texture in the finished product.
2. Cool the heated milk to 110°F.
3. Adjust temperature of water in setting pans to 110°F. Set oven temperature at lowest point to maintain water temperature at 110°F. Alternately use commercially available yogurt maker or insulated container that will keep the yogurt mixture warm during the required time.
4. Add to the milk at 110°F 1 cup (8 oz.) yogurt starter culture. Mix well but gently. Do not incorporate too much air.
5. Pour into yogurt containers and cover with lid. If fruit is to be added to the yogurt, it should be put in at this point. Put the fruit in the bottom of the cup, before adding the inoculated milk. The fruit should also be at a temperature of 110°F. If sugar, in addition to that with the fruit, is desired, it can be mixed in just prior to eating.
6. Put filled containers into setting pans in oven. Maintain temperature at 110°F. If water temperature in pan is 110°F, temperature in container should also be 110°F.
7. Check temperature frequently. Do not exceed 115°F as this temperature will kill the culture.
8. Maintain this temperature for 3-4 hours.
9. When firm coagulation has formed, remove from oven and cool immediately in ice bath or refrigerator.
10. Save unopened container in the refrigerator to use as starter for next batch.

†Supermarkets generally sell instant NFDM; health food stores often sell regular NFDM. Know which you are using.

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