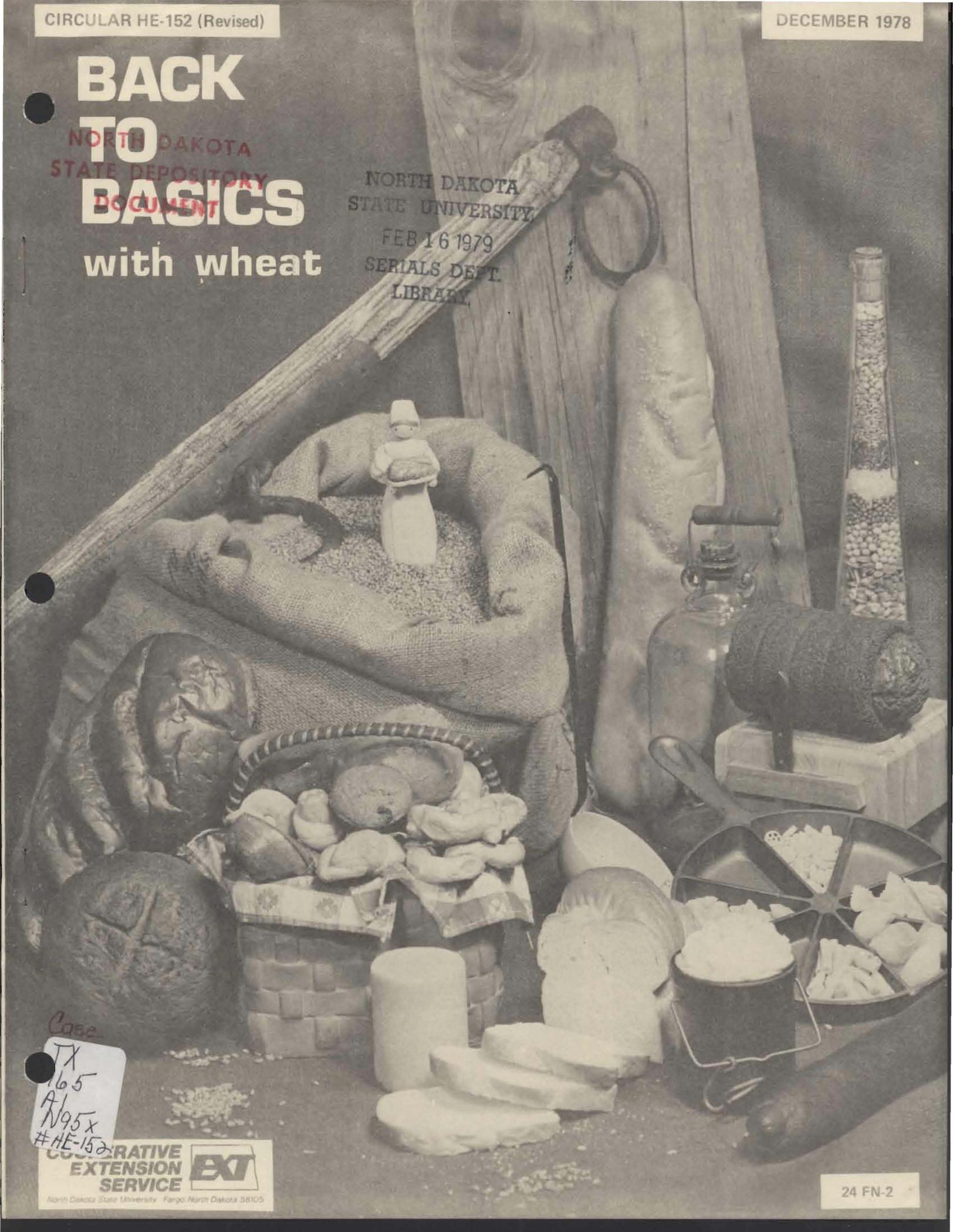


BACK TO BASICS with wheat

NORTH DAKOTA STATE DEPOSITORY DOCUMENT

NORTH DAKOTA STATE UNIVERSITY
FEB 16 1979
SERIALS DEPT.
LIBRARY



Case
TX
165
A1
N95x
#HE-152

COOPERATIVE EXTENSION SERVICE **EXT**
North Dakota State University Fargo, North Dakota 58105

Back To Basics With Wheat

North Dakota raises the second largest wheat crop in the nation. Only Kansas produces more wheat, but the state raises the most hard red spring wheat in the nation.

Hard red spring is a high protein wheat with a superior quality gluten content. This wheat makes the best bread but is usually blended with a lower protein hard red winter wheat for the retail markets. The blending reduces the price of the flour.

North Dakota also raises about 85 per cent of the nation's durum crop. Durum is milled into a coarse, granular substance called "semolina." Semolina is combined with water to produce macaroni with firm texture, superior color and mild flavor. When other wheats are used, the quality of the product is substantially reduced.

For further questions concerning North Dakota wheat products, write to:

**North Dakota State Wheat Commission
1305 East Central Avenue
Bismarck, North Dakota 58505**

**Cooperative Extension Service
North Dakota State University
Fargo, North Dakota 58102**

**PAT BECK
Nutrition Specialist
North Dakota Cooperative Extension Service**

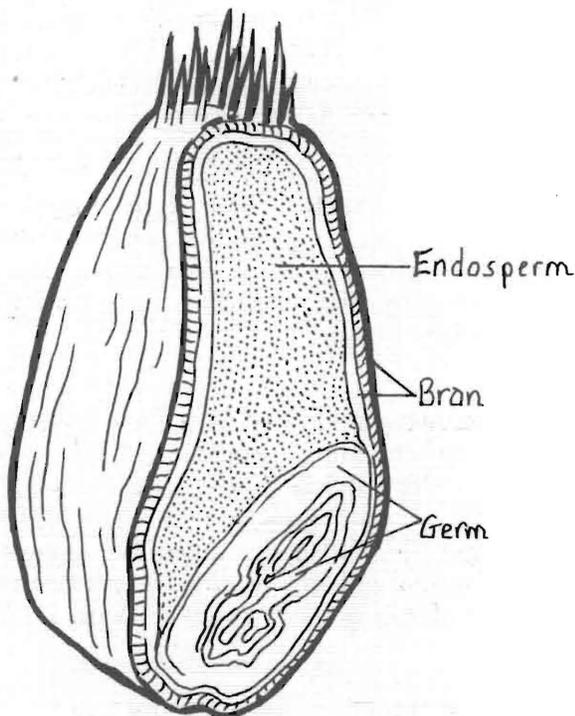
**JUDI ADAMS, Nutritionist
North Dakota State Wheat Commission
in cooperation with
North Dakota Cooperative Extension Service**

I. NUTRITION OF BREAD

Bread offers us much more than just the smell and flavor. It is a nutritious food and allows much variety in color, shape and flavor. You can choose from white, whole wheat, cracked wheat, rye, pumpernickel, French, Boston brown, brioche, sourdough and numerous others that have been passed down for generations.

Whole wheat and enriched white breads are very nutritious and should be included in your diet daily.

There is some confusion over the term "enrichment" of breads and cereals. Forty years ago the government requested enrichment of breads and cereal products to combat diseases caused by nutritional deficiencies. During the milling process, as the bran and germ are removed from the kernel, most of the B vitamins and iron are removed with them. "Enriched" means that the main B vitamins (thiamine, riboflavin, niacin) and iron have been added back to the wheat flour. Because of this enrichment, bread has become one of the best sources for the B vitamins and iron.



White Bread Versus Whole Grain Bread

In ancient times, white bread was served only to the royal families and clergy. Peasants were encouraged to use whole wheat and bran for their bread baking. Pity the poor kings and queens who missed out on the great flavor and nutrition of whole wheat bread! White flour in those days was not enriched, so white bread was not nearly as nutritious as it is today.

Whole grain breads have retained the B vitamins and iron and many trace elements such as zinc, phosphorus, vitamin E and D, and calcium, that are lost in milling white flour. Nutritionists agree these nutrients are important and whole grain breads are better sources than white bread. However, these nutrients are easily obtained by eating a variety of other foods. In most studies conducted, it has been found that iron is absorbed better from enriched white bread than whole grain bread because of the phytic acid in the whole wheat.

When purchasing bread, be sure to check the label to see that it has been enriched. Approximately two-thirds of all of the flour sold in the United States is enriched. Many states, including North Dakota, have mandatory enrichment laws.



Calorie Comparisons

Many people have the misconception that bread and cereal products are fattening. Often these are the first items eliminated from the diet when reducing. However, carbohydrate grams and protein grams each provide the same number of calories—4 per gram—while 1 gram of fat provides 9 calories. We need a variety of protein, carbohydrate, and fat calories to maintain healthy tissue in our bodies.

It is dangerous to cut out any one food when dieting. The best results come when you cut down on the total amount of food you eat.

The following is a list of common nutritious foods and their calorie values. Compare a slice of bread with some of your other favorite foods:

Foods	Caloric Value
1 slice bread	65
1 cup orange juice	110
1 hard cooked egg	80
1 cup whole milk	160
1 medium apple	70
4 oz. lean roast beef	240
1 average baked potato	90
5" ear of corn	70

II. TYPES OF WHEAT FLOUR AND PRODUCTS

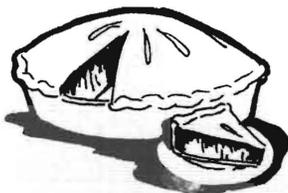
There are numerous wheat flours and products on the market that can be used in bread baking. It is important to know their advantages and disadvantages.

Whole wheat or graham flour: contains the entire wheat kernel—germ, bran and endosperm. It has a high fat content so tends to become rancid sooner than white flour. Refrigeration will slow the rancidity process. Whole grain flours have a lower percentage of gluten (the protein which gives the framework to bread), so the loaves will be heavier. The bran also tends to cut the gluten strands, which further decreases the gluten structure. Whole wheat also contains phytic acid, a substance which is believed to decrease iron absorption.

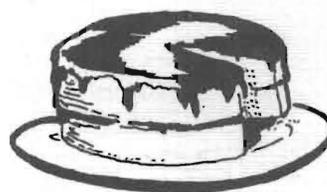
White all-purpose flour: contains only the endosperm of the kernel. It is a law in many states (including North Dakota) that white flour must be enriched with the three main B vitamins (thiamine, riboflavin and niacin) and iron. Controversy rages over the amount of iron absorbed from white bread, but most authorities believe it is more than that absorbed from whole wheat bread. Often it is bleached, because the consumer has always preferred a white flour.

Unbleached all-purpose flour: it is identical to white flour except that it has not been commercially bleached. It will eventually bleach itself as it ages, but until that happens the baking qualities are less desirable. The commercial bleaching agents are completely harmless and do not leave any residue.

Bread Flour: is from high protein hard red spring and contains a strong gluten to give a better volume and texture to breads. It is rarely sold retail, but is used by bakers. If the home baker can buy it, it must be kneaded a full 10-12 minutes to develop the gluten.



Pastry flour: comes from a blend of low protein wheats and is good for pies and pastries. It, too, is rarely sold on the retail level, but it can occasionally be found in the South.



Cake flour: is made from low protein soft wheat and makes tender, light cakes. It is usually bleached and may or may not be enriched. Be sure to purchase only the enriched.

Instantized flour: is an all-purpose flour that has been subjected to a process to make it granular. Its granular texture makes it free pouring and dust free—great for gravies and dusting baking pans but not recommended for pies, cakes or breads. It is often twice as expensive as regular all-purpose flour.

Self-rising flour: is an all-purpose flour with baking powder and salt added. This saves time when baking quick breads but is slightly more expensive. For yeast breads, special recipes must be used. It is sold mostly in the South.

Wheat products such as bran, germ, bulgur and cracked wheat are often added to yeast breads. They improve the nutritional value and add a crunchy texture and nutty flavor. Bulgur must be soaked before adding to dough.

These products are low in gluten and have sharp edges that cut the gluten strands. You can experiment, but a general rule is not to use more than one-fourth cup of the product to 2 cups flour. For example: if the recipe called for 6 cups of flour you would add three-fourths cup of germ or bran, etc., and only about $5\frac{1}{4}$ cups of flour.

Also, leave the bread dough as moist as you can handle because these products absorb liquid and tend to produce a drier loaf.

The third rule to remember is to knead less, since the sharp edges of these products will cut the gluten strands.

III. SOURDOUGH - MAN'S OLDEST YEAST BREAD

The history of sourdough goes back almost 6,000 years to the Egyptians. For centuries it was man's only method of leavening bread.

Most Americans associate sourdough with the Alaska gold rush or California gold fields. San Francisco still has a reputation for producing the best sourdough bread in the world. So common was the crock of starter in the miner's gear that these men were often called "sourdoughs."



Inventive miners and Indians from the Thlinget tribe of Hooch-in-noo, Alaska extracted the watery layer of liquid off the sourdough crocks for recreational use. This became known as "hooch," and as one old-timer put it, "It is only slightly less volatile than high test aviation gasoline."

There are various recipes for sourdough starters. Experiment with them until you find the best. Starters can be interchanged with any sourdough recipe by using a little imagination and common sense. Many cooks find they need to add commercial yeast to sourdough bread in order to get an acceptable volume.

To Make Sourdough Starter

For best results use glass or pottery containers. Never use a metal container or leave a metal spoon in the starter, because the acid will corrode the metal. A good starter contains only flour, water, and yeast. It has a clean, sour, mild odor. A watery liquid will separate from the batter when it stands several days, but this does not matter, just stir it in. If replenished every few days with flour and

more water, the starter keeps fresh. If starter is not to be used for several weeks, freeze it to keep it from spoiling. To carry it to camp, add enough flour to shape it into a ball and place it in a sack of flour. In the dried form the yeast goes into a spore stage which will keep inert for a long time, like old-fashioned yeast foam. Warmth and water bring the yeast back to the active stage.

When ready to use, look for a warm place to put the starter (80°-90° F). Good spots are on top of water heaters, built-in refrigerators, or other partially enclosed areas where heat collects. If you have a gas range, place the starter on a burner near (but not over) the pilot or in the oven, or place the container directly in front of (but not touching) the light in an electric oven. Close the oven door and turn on or prop the door open just enough to keep the light on. If you're real conscientious, do like the old-timers did and wrap it up in a blanket and take it to bed with you.

Setting a Sponge

To always have an ample supply, each time you use part of your starter replenish it with equal amounts of warm water (90° to 100° F) and flour. (For example, if you use one-half cup starter, blend in a mixture of one-half cup warm water and one-half cup flour.) Cover and let stand in a warm place six to eight hours or overnight until it is again full of bubbles; remove what you need for your recipe, then store, covered, in the refrigerator until you use it again.

If you bake regularly, the starter should keep lively and active; if you don't, it's best to discard about half of your starter and replenish it with warm water and flour about every two weeks. Or you could freeze your freshly fed starter for one and one-half to two months. The fermenting action is considerably slowed during freezing, so you'll need to let the starter thaw at room temperature then put in a warm place for about 24 hours or until bubbly.

The "feel" of this dough after kneading is different than that of most yeast doughs. It will feel just slightly tacky when lightly touched.

SOURDOUGH STARTER RECIPES

From Yeast in the Air

In a large, uncovered bowl, set out 2 cups of warm milk for 24 hours in 80° temperature. Stir in 2 cups flour and allow to stand for 48 hours more, uncovered. It should start to bubble and smell sour. Store in a quart container in refrigerator with a loose cover.

Sourdough Starter Using Yeast

- 1 cup water
- 1 cup flour
- 1 tsp. yeast or 1 cake

Combine ingredients in a large container. Let mixture set at room temperature, with lid ajar, for 48 hours or until it has a pleasant, sour odor. Store in refrigerator with a loose cover.

Sourdough Starter - Yogurt

Start with 1½-quart glass, pottery, rigid plastic, or stainless steel container. Rinse with hot water for several minutes, then wipe dry.

Heat 1 cup skim, low-fat, or whole milk to 90° to 100° F on a thermometer (skim gives the most tang, whole milk the least). Remove from heat and stir in 2 tablespoons plain unflavored yogurt (low-fat gives tangiest flavor). Pour milk into warm container, cover tightly, and let stand in a warm place. Temperatures of 80° to 100° are ideal (above 110° bacteria may be killed—it could smell sour, but won't get bubbly; below 70°, it doesn't grow well).

After about 18 to 24 hours, the starter should be about the consistency of yogurt (a curd forms and the mixture does not flow readily when container is slightly tilted). During this time if some clear liquid rises to the top of the milk, simply stir it back in. However, if the liquid has turned light pink in color, it indicates that the milk is beginning to break down; discard and start again.

After a curd has formed, gradually stir 1 cup regular all-purpose or unbleached flour into the starter until smoothly blended. Cover tightly and let stand in a warm place (80° to 100° is ideal) until mixture is full of bubbles and has a good sour smell; this takes 2 to 5 days.

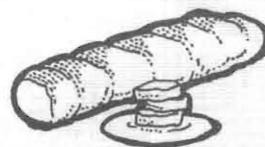
During this time, if clear liquid forms, stir it back into starter. But if the liquid turns pink, spoon out and discard all but ¼ cup starter, then blend in a mixture of 1 cup each warm milk (90° to 100°) and flour. Cover tightly and let stand again in a warm place until bubbly and sour smelling.

Recipes can be found in most bread cookbooks. This is an excellent one for French bread.

All recipes in this publication are in Fahrenheit temperatures. When metric measurements become more common, all recipes will have to be adjusted to Celsius temperatures.

Sourdough French Bread

- 1 C. hot water (about 100°)
- 2 C. sourdough starter
- 7½-8 C. all-purpose flour, unsifted
- 2 t. salt
- 1 pkg. commercial yeast (optional) dissolved in ¼ C. water (110°F)
- 2 t. sugar
- 1 t. cornstarch mixed with ½ C. water in saucepan
- Cornmeal



In a large bowl combine the water, starter, and 4 cups of flour; stir until smooth. Cover bowl with clear plastic film and let stand in a warm place (85°) for 6 to 8 hours or overnight (or until sponge is very thick, full of bubbles, and spongy looking).

Stir into sponge the salt, sugar, dissolved yeast and enough of the remaining flour to form a very stiff dough, about 3 cups. Turn dough out onto a board coated with part of the remaining flour and knead until smooth and elastic, about 10 to 12 minutes; add flour if needed to prevent dough from sticking. Place dough in a greased bowl, turn over to grease top, cover, and let rise in a warm place until double in bulk, about 1½ or 2 hours.

Punch down and divide in half. Knead each piece gently on a floured board just until dough has a smooth surface. If you have only one oven, wrap one piece of dough in clear plastic film and refrigerate.

For oblong loaves, shape each piece of dough into a smooth log by rolling it back and forth, gently elongating loaf about 14 inches. Sprinkle a piece of stiff cardboard (about 7 by 18 inches) with 3 tablespoons cornmeal and set loaf on top. For round loaves, shape dough into smooth balls; lift up and smooth top by pulling down and pinching a seam underneath. Place on 12-inch-square piece of stiff cardboard sprinkled with 3 tablespoons cornmeal.

Cover loaves lightly with clear plastic film; let rise in a warm place until puffy and almost double, about 1 to 1½ hours. Adjust oven racks so they are on the two lowest positions. Place a baking sheet on top rack as the oven preheats to 400°. Just before bread is ready to bake, place a rimmed baking sheet on the lowest rack and fill with about one-fourth inch boiling water.

Meanwhile, heat cornstarch and water to boiling, stirring; cool slightly. With a razor blade or sharp knife cut half-inch-deep slashes in top of loaves. Cut three slightly slanting slashes in oblong loaves or cut slashes in a criss-cross pattern in round loaves. Then brush each loaf evenly with the cornstarch mixture, making sure to moisten sides of loaves resting on cardboard. Slip each loaf from the cardboard onto preheated baking sheet on top shelf in oven.

Bake at 400° for 10 minutes; then brush each loaf evenly again with the cornstarch mixture. Bake 20 to 25 minutes longer or until loaves are golden brown and make a hollow sound when tapped. Cool on wire racks. Makes two loaves.

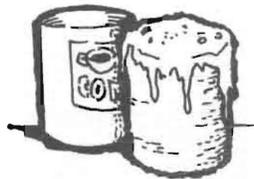
When you put the first loaf in the oven to bake, remove the second piece of dough from the refrigerator and shape as above; it will take slightly longer to rise. Bake as directed.

IV. ALTERNATIVE BAKING METHODS

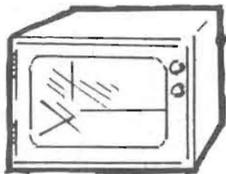
Slow-Cooker



There's nothing better than the smell of fresh warm yeast bread, hot out of the oven, unless it's 105° outside and 99° in your kitchen! Summer baking is not all that great. To solve the problem, try a slow-cooker. It's economical, won't heat up your kitchen and bakes while you shop, work in the field, sew or whatever you need to do.



Yeast breads can be made in a slow-cooker, but most people have better luck with batter breads and cakes. A 2-pound coffee can, greased and floured, works well, but some brands of cookers have their own bread and cake pan that can be purchased separately. Be sure to use the instructions that come with your slow-cooker. If none are available, write to the home economics department of the company for recipes.



Microwave Oven

You can prepare a variety of breads in your microwave oven, although some kinds work better than others. Most kinds of breads rise well in the oven. Best results are obtained when breads are cooked uncovered. Whole grain breads that have a dark dough make a more attractive product.

Any batter will rise higher when cooked in a microwave oven, so fill the baking dish only half full rather than the customary two-thirds. A coffee cake mix tends to overflow a smaller round dish, so it is a good idea to use an 8-inch square or a 10 x 6 inch oblong dish. If you feel that your baking dish is too small, you can always put extra batter in custard cups to make muffins.

Yeast Breads: Remember that there will be no browning or hard crust, so you may want to try a

bread with a dark dough, such as the casserole bread, or one that is to be toasted later, such as the English muffin bread. You can also use your oven to thaw and proof frozen bread dough. Bread baked in the oven is especially good for sandwiches because it does not have a hard crust and it will stay moist for several days. Your oven also can be used to reheat any bread or rolls, giving even slightly stale bread a fresh taste. Reheat bread and rolls on a paper napkin, paper plate or cloth napkin to absorb moisture.

Follow your oven's directions for baking and reheating instructions.

BREAD IN THE MICROWAVE OVEN

Casserole Bread

- 1½ C. cold water
- 1/3 C. yellow cornmeal
- 1 t. salt
- 1/3 C. molasses
- 2 T. butter or margarine
- 1/4 C. water (110-120° F)
- 1 pkg. active dry yeast
- 3¼-3½ C. unsifted all-purpose flour

In saucepan, combine water, cornmeal and salt. COOK, uncovered until mixture boils and begins to thicken stirring occasionally. Add molasses and butter; cool to lukewarm. Dissolve yeast in warm water. Stir into lukewarm cornmeal mixture. Mix in flour until well combined. Arrange evenly in 2 quart casserole or loaf pan. Rub top with oil or softened butter. Cover casserole (allowing space for bread to rise)* and refrigerate overnight.

Next day, remove from refrigerator and COOK, uncovered, 10 MINUTES or until no doughy spots remain. Cool 5 minutes in casserole; turn out of pan and cool completely. One Loaf

*For conventional oven: Follow directions to *. Then, let rise in warm place (80° F) until dough reaches top of pan (about 45 minutes). Bake in 350° F oven for 40 to 50 minutes.

English Muffin Bread

- 5 C. unsifted all-purpose flour
- 1 T. sugar
- 2 t. salt
- 2 pkg. active dry yeast
- ½ C. water (110-120° F)
- 2½ C. milk
- ¼ t. soda
- 1 T. warm water

In large mixing bowl, combine 3 cups flour, sugar and salt. Dissolve yeast in water. Heat milk until warm, (110° F) and combine with yeast. Add milk to flour mixture. Beat by hand or mixer until smooth. Stir in remaining flour to make

a stiff batter. Cover; let rise in warm place until light and doubled in size, about 1 hour.

Dissolve soda in warm water. Stir down yeast batter; blend in soda mixture, mixing until well blended. Divide batter between two greased 1½ quart (8 x 4) loaf dishes. Cook and let rise in warm place until doubled, about 45 minutes. *COOK each loaf, uncovered 6 MINUTES or until no doughy spots remain. Cool 5 minutes; loosen edges and remove from pan. Cool completely. To serve, slice and toast in toaster or under broiler until edges are brown. Two Loaves.

*For conventional oven: Follow directions to *. Then, bake in 375° F oven for 35 to 40 minutes.

ROUGHING IT

Quick breads such as pancakes, Indian fry-bread and even doughnuts adapt well to outdoor cooking. Biscuits, muffins, batter breads and yeast breads which require an oven are a bit more difficult, but most appreciated by campers on a cold, damp morning.

You will, of course need an improvised oven. A Dutch oven or reflector oven work well for baking.

Dutch Oven

Dutch oven cooking is one of the oldest and is still one of the most popular types of cooking in the out-of-doors. A Dutch oven is probably the most versatile piece of cooking equipment available.

The Dutch oven is a piece of equipment that can be utilized in a variety of cooking methods. It is ideal for shallow frying, deep fat frying, roasting, baking, and stewing. Therefore, you may cook with either dry heat or moist heat.

Frying and deep frying methods use heat only on the bottom. Baking, roasting, and stewing require an oven-type heat created by placing coals both on the lid and below the Dutch oven.

There are two types of ovens, the outdoor and the indoor. The outdoor oven has three legs, designed to hold the oven above hot coals and to allow air circulation below it. It has a relatively flat lid with a handle and with turned-up edges so that hot coals can be placed on it. The indoor oven is without legs so that it may rest on a flat stove. Its lid is round and without raised edges. However, this oven can be converted for outdoor cooking by placing three similar-sized rocks or bricks under it or three to four 10 by 12-inch spikes to support it above the

coals. To help the lid hold coals, make a foil ring just smaller in circumference than the lid. Set the foil on the lid and place hot coals inside the ring. The lid can also be turned upside down to hold hot coals.

If a Dutch oven is not available, a large kettle from a camp cooking set can also be used in many ways similar to the Dutch oven, but it will not hold heat as well and will burn more easily.

For baking, place a layer of foil, shiny side up, inside the Dutch oven. Place the food in the foil to bake it. This is a good way to bake cakes, upside-down cakes, biscuits, pies, and apples. Allow approximately the same amount of cooking time in the Dutch oven as you would in your oven at home.



Reflector Oven

*Reflector ovens can be purchased or homemade. For instructions on how to make a reflector oven, refer to books on outdoor cooking.

Campers who roast or bake foods in a reflector oven will experience a real treat because it is one of the few methods of outdoor cooking where the cook can watch the cooking process.

A reflector oven operates with a concentration of dry heat. This outdoor method closely duplicates the process of the oven in your home. Dry heat is created, then reflected from the walls of your oven around the food. Similarly, heat from the open fire is reflected off foil, metal, or rock into the oven and from the sides of the reflector oven.

Any foods that can be baked in an oven can be baked in the out-of-doors in a reflector oven. Cookies, brownies, biscuits, pizza, and cake are some of the favorites. Meats can be broiled quite easily also.

Place the food on a piece of foil or a pan which will fit on the shelf of the reflector oven, and place the oven near the fire. Knowing just where to place the reflector oven so that it will heat to the right temperature is the real key to cooking effectively.

**Roughing It Easy*, Dian Thomas, Brigham Young University Press, 1974.

An oven thermometer inside the oven works well. Do not place it on top of the oven because it will catch the rising hot air and register a higher temperature than the shelf temperature itself. It is possible to learn to guess the temperature with reasonable accuracy by holding your hand just in front of the oven. If you can hold it there for only one or two seconds, the temperature is near 500 degrees. If you can hold it there for three to four seconds, 400 degrees; six seconds, 300 degrees; and seven to ten seconds, 200 degrees.

After the food has been cooking for five minutes, check it to make sure that it is cooking properly. Just lift the oven away from the fire area. Sometimes the food cooks faster at the front of the oven than it does at the back. If this happens, check to make sure that the oven is not too hot. Turn the food occasionally so that it will cook more evenly. If the top of the food is browning faster than the bottom, the fire is too large. Similarly, the fire is too small if foods are browner on the bottom than on the top.

V. WHAT CAUSES BREAD BAKING FAILURES

Similar end products may come from a variety of causes. It's impossible to judge by looking at a loaf, what for certain was done wrong. However, a variety of causes can be suggested. Sometimes the flour used is the total problem. It can be too old and cause crumbly, "short" dough or too low in protein, which can cause poor volume and texture.

Although today's all-purpose flours are lower in protein, it is still possible to bake good bread if some simple recipe modifications are made. Most home recipes direct the baker to combine all of the ingredients with only a partial amount of flour when beginning the process. This mixture should then be beaten longer than was previously the case to insure better gluten development. The dough should be beaten for four to five minutes with a wooden spoon or about three minutes if using an electric mixer. Kneading time should be reduced to five to seven minutes from the normal time of eight to ten minutes. Overkneading is a possibility because of the lower flour content. Check your recipe to see if it contains about 3 per cent shortening by weight. This seems to improve the bread (approximately 2 tablespoons of shortening per 6 cups of flour). Make sure you do not let the dough overrise.

Causes of Poor Quality

Outside Appearance

Poor Shape:	Improper shaping of loaf; too much dough for pan; insufficient rising time; inadequate heat circulation in oven.
Too Small:	Too much salt; not enough yeast; insufficient rising period; oven temperature too high; incorrect water temperature for yeast.
Too Pale:	Not enough sugar; temperature of dough during mixing and rising too high; oven temperature too low.

Too Large:	Not enough salt; too much yeast; rising period too long; oven temperature too low.
Too Dark:	Too much sugar; insufficient rising time; oven temperature too high.
Uneven Color:	Improper shaping of loaf; incorrect placement in oven; uneven heat in oven.
Tough:	Not enough shortening; insufficient rising time; overbaking.
Too Thick Crust:	Crusting of dough during rising time; oven temperature too low; overbaking.
Cracks:	Crusting of dough during rising; cooling loaf too quickly.
Blisters:	Improper shaping of loaf; temperature of rising too low; rising time too long.
Lack of Shred:	Overkneading; rising time too long.
(Stretch marks on side of loaves - evidence of some rising in oven)	
"Flying" top crust: (air space beneath crust)	Sugar proportion wrong; dough too stiff; insufficient rising time; crusting of dough during rising; overkneading.

Inside Appearance

Poor Color:	Too much yeast; temperature of dough during mixing and rising too high; rising time too long; oven temperature too low.
Streaks:	Crusting of dough; improper mixing of dough; too much flour used during kneading and shaping loaf.
Coarse:	Dough too soft; temperature of dough during mixing and rising too high; rising time too long.

Uneven: Dough too soft; too much flour used during kneading and shaping; improper punching and shaping.

Poor Texture: Too much flour; wheat flour substitutes; temperature of dough during mixing and rising too high; rising time too long; overkneading.

Flavor: Wrong proportions of ingredients; temperature of dough during mixing and rising too high; rising too long.

Salt - Regulates yeast growth and gives flavor.

Sugar - Yeast food, increases tenderness and browning.

Flour - Provides structure, B vitamins, protein and iron.

Liquid - Dissolves yeast and sugar and develops gluten. Water doughs make a more crusty product, more volume. However, milk doughs produce a finer texture, better flavor and hastens browning, as well as making a complete protein.

Shortening - Tenderizes.

TIPS FOR YEAST BAKING

Differences in amount of flour needed depends on kind of flour and humidity in the air.

Scald raw milk and warm pasteurized milk. Easiest and cheapest to use non-fat dry milk and warm or hot water in the appropriate amount.

Rest period absolutely necessary to relax gluten to make handling easier.

Gluten Formation

Vigorous beating speeds up gluten formation. Kneading develops the gluten—forms an elastic mesh that traps the gas formed by the yeast. Overkneading stretches the gluten to the breaking point and destroys the gas trapping mesh.

Test for Raising

Put fingers into dough. If dents remain, ready to bake. Do not over-raise.

Test for Doneness

Sounds hollow when thumped on top.

Purposes of Ingredients

Yeast - Leavening - produces carbon dioxide.

Water Temperature for Yeast

Compressed yeast 80° - 100° (warm)
 Dry Yeast (dissolved) 110° - 115° (hot)
 Instant blend dry yeast 120° - 130° (very hot)

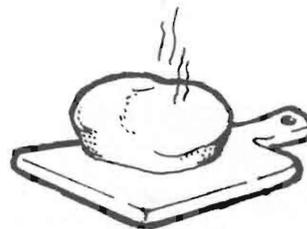
Substitutions

Honey - Straight across cup for cup (this does not hold true for cookies and cakes).

Whole Wheat Flour - 3 1/3 cups whole wheat flour for 4 cups white flour.

Remember

A good loaf is symmetrical with an evenly browned crust. It is fine in texture with no large air bubbles. The "crumb" is slightly moist, soft and tender. The bread has a fresh tempting aroma and a pleasing, well baked wheat-like flavor.



VI. RECIPES

Whole Wheat Bread

1 pkg. active dry yeast
 1/3 C. dry milk
 2 t. salt
 2 C. water (115° F)
 1/4 C. molasses
 2 T. softened shortening
 2-3 C. all-purpose enriched white flour
 3 C. whole wheat flour
 1/4 C. cracked wheat

Stir together undissolved yeast, dry milk, salt and two cups white flour. Add water, shortening and molasses. Beat vigorously until dough sheets off wooden spoon. Add whole wheat flour and cracked wheat to make dough manageable. (The softer the dough, the moister the bread.)

Knead dough about 5 minutes. Place in lightly greased bowl, turning to grease all sides. Cover with plastic wrap and towel. Let rise until double in warm room (80°) or over bowl of hot water. Punch down. Let rest 10 to 15 minutes, shape, let rise in pans until dent remains when finger is pressed in corner of dough.

Bake at 375° for 35 to 40 minutes. Remove from pans IMMEDIATELY and brush with oil. Let cool on rack out of draft and then place in plastic bag and seal with closure.

Quick White Bread
(From Start to Finish in 2 Hours)

5-5½ C. enriched all-purpose flour
2 pkgs. dry yeast
1/3 C. non-fat dry milk
2 C. water
2 T. sugar
2 T. oil
2 t. salt
Oil

Combine 2 cups flour, yeast, non-fat dry milk, salt and sugar. Stir together. Add water and stir well. Add oil and beat with mixer 3 minutes or with wooden spoon about 5 minutes. Stir in remaining flour, enough to make a soft dough. Knead on lightly floured surface about 5 to 7 minutes. Cover dough with bowl, let rest 20 minutes. Shape into two loaves and brush lightly with oil. Let rise in warm place until double, about 30 to 45 minutes. Bake in 400° oven for 35 to 40 minutes. Remove immediately from pans. Brush with oil and cool on wire rack.

Sweet Roll Dough for Rolls and Coffee Cakes

1 pkg. dry yeast
1/4 C. water (120°-130°)
1/4 C. milk (120°-130°)
1/4 C. sugar
1/2 t. salt
1 egg
1/4 C. shortening
2¼-2½ C. enriched white flour

Mix together yeast, sugar, salt and 1¼ cup of flour. Stir in water and milk. Add egg and shortening and beat until smooth. Mix in enough remaining flour to make dough easy to handle.

Turn dough onto lightly floured board; knead until smooth and elastic, about 5 minutes. Place in greased bowl; turn greased side up. (At this point, dough can be covered and refrigerated 3 to 4 days.) Cover; let rise in warm place until double, about 1 hour. (Dough is ready if impression remains when touched.)

Punch down dough. Shape dough into desired rolls. Cover and let rise until double. Bake 12 to 15 minutes at 375° F.