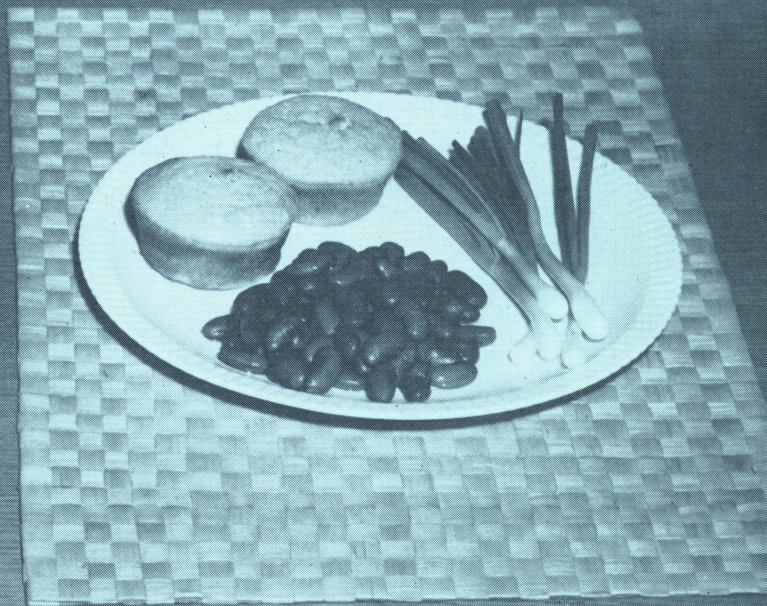
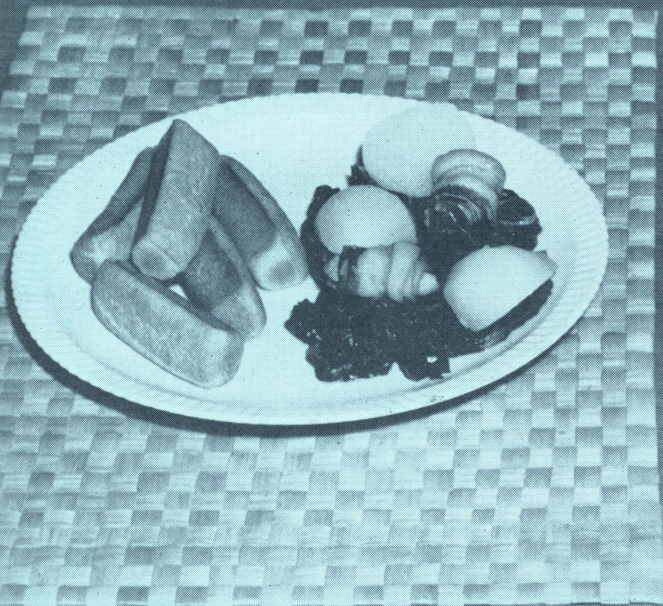


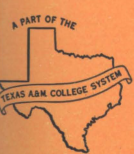
Better Corn Meal and Grits

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Many Texans enjoy their corn bread the more when served with certain vegetables, among them turnips and greens, and red beans and onions.



WHY BE CONCERNED ABOUT CORN MEAL IN TEXAS?

1. Because so much of it is eaten by Texans, especially by those living in small towns and in the country.
2. The amount of corn meal eaten in Texas varies greatly. Some surveys found less than one-half pound per person per month in some city families, to over 6 pounds per person per month in rural families.
3. The 400 rural families in another survey used two-thirds as much corn meal as wheat flour.
4. Families with low incomes ate nearly twice as much corn meal as families with high incomes.



Most Texas families get their corn meal from the grocery.

Better Corn Meal and Grits

JESSIE WHITACRE, *Professor*

Department of Rural Home Research

This publication is based on an extensive cooperative study of corn meal and grits in the diet of Texans. Six technical publications have been issued on portions of the work. A number of reports on different phases have been made to professional groups in their annual meetings, and articles have been printed in the official publications of these associations. Several graduate students have filed with their colleges written accounts of their research, some of them as theses for master degrees.

This simplified presentation is made in the hope that it will help Texans, and others who frequently eat corn meal and grits dishes, to get the greatest possible benefit from these foods.

The following pages also have been prepared as slides which are available on loan from the Agricultural Information Office of the Texas A&M College System.

A great many persons have had a share in collecting the information. Grateful acknowledgment is made to those members of the various agencies taking part in the study and to the large number of persons who assisted them.

Credit is given to those coworkers who took part in selecting the material, devising graphs, planning pictures and formulating statements included in this publication. These are: Mina W. Lamb (Texas Technological College); Laura McLaughlin (Texas State College for Women); Florence I. Scoular (North Texas State College); the food specialists of the Texas Agricultural Extension Service—Maeona Cox, Jimmie Nell Harris, Louise Mason and Frances Reasonover; and former technicians of the Department of Rural Home Research—Kathreen Thomas and June K. Pace.

Thanks also are due to Helen Forsthoff Darling, Charlene Schram and Mary F. Futrell, Department of Rural Home Research, for their contribution in the final typing and preparation of graphs and pictures, and to the Photographic and Visual Aids Laboratory, Texas A&M College System, for its generous service in making slides and photographs.

SOURCE OF INFORMATION ON CORN MEAL AND GRITS IN TEXAS

1. Several agencies in Texas concerned with improving the nutrition of Texans have joined in an extensive study of the place of corn meal and grits in the diet.

2. These agencies include the:

Texas State Nutrition Council through food and nutrition staff members of the:

Texas Agricultural Experiment Station

Texas Agricultural Extension Service

Texas State College for Women

Texas Technological College

University of Texas

North Texas State College

Texas Dietetic Association

Texas Home Economics Association

3. Together these agencies have learned:

The amount of corn meal used by different groups of Texans

Where Texans get their corn meal and grits

How corn meal and grits are prepared in Texas homes and institutions.

How much enrichment improves the food value of corn meal and grits in the raw stage and when they are ready to be eaten.

NATURAL FOOD VALUE OF CORN MEAL AND GRITS

1. Whole corn meal is a better food than degermed meal.
2. However, not much whole corn meal is made because the fat in the germ soon becomes rancid and gives the meal a bad flavor.
3. When corn is degermed to make meal and grits, most of its minerals and vitamins are lost.
4. The protein is not the best kind because it is low in one of the amino acids (tryptophane) which the body does not make for itself.
5. Corn is not as good as wheat or oats for the B-vitamins—B₁ (thiamine), B₂ (riboflavin) and niacin.
6. Degermed, non-enriched corn meal is excellent for calories, fair for minerals and protein, and poor for B-vitamins.

EATING QUALITY OF CORN MEAL AND GRITS DISHES

1. Before any standardized recipe was accepted for use in the study, it gave a product that experienced judges rated good or excellent.
2. Texas college classes and many home demonstration club women tried out the family-size recipes for corn bread. They liked them.
3. College dormitories tried the standardized institutional recipe for corn bread. The students liked it.
4. The standardized family-size recipes are on pages 17, 18 and 19.

HOW ENRICHMENT IS DONE

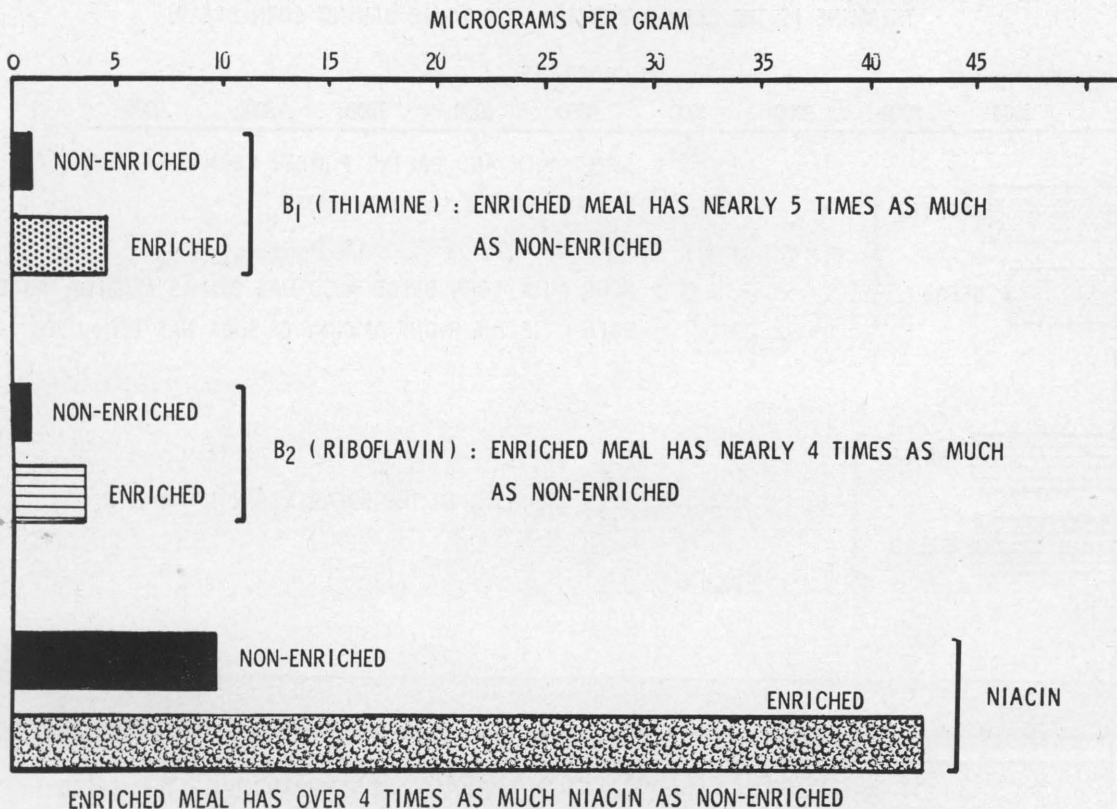
1. Corn meal and grits are "enriched" by adding a mixture of certain vitamins and minerals at the time of milling.
2. Federal food standards define "enriched corn meal" and "enriched grits."
3. Federal standards require adding three vitamins and iron so that each pound of either corn meal or grits will contain:

Ingredients	Not under	Not over
B ₁ (thiamine)	2.0 mg	3.0 mg
B ₂ (riboflavin)	1.2 mg	1.8 mg
Niacin	16.0 mg	24.0 mg
Iron	13.0 mg	26.0 mg

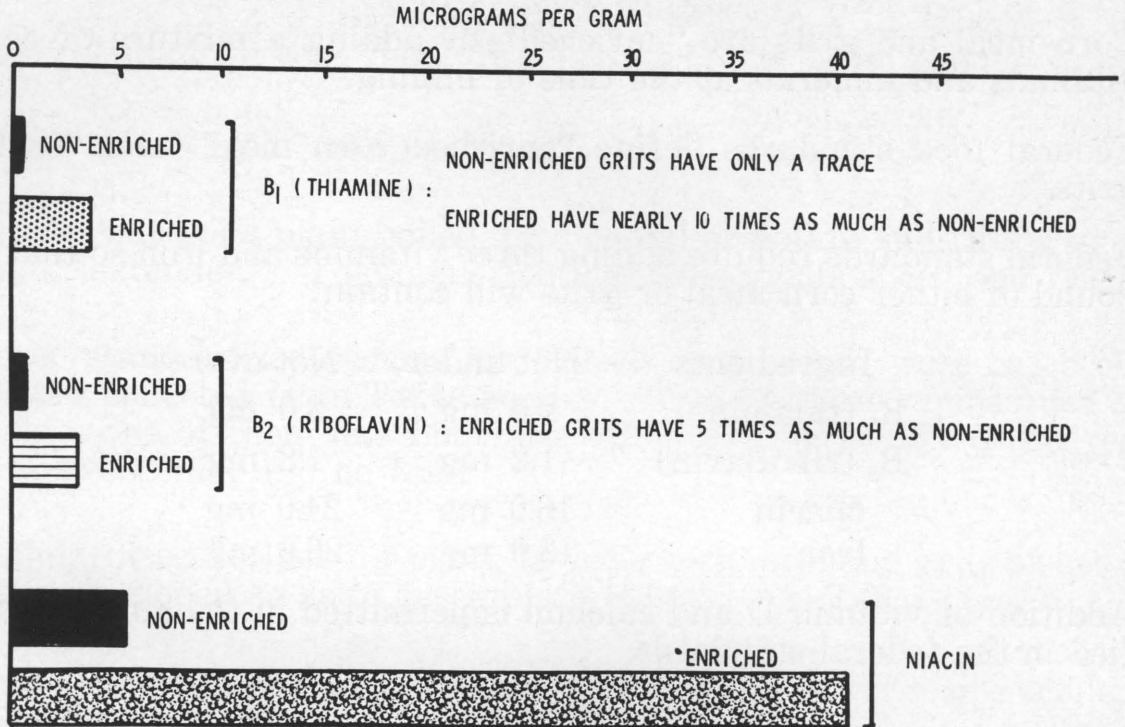
4. Addition of vitamin D and calcium is permitted in the amounts specified in the federal standards.

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ENRICHMENT MAKES A BIG DIFFERENCE IN THE VITAMIN VALUE OF CORN MEAL.



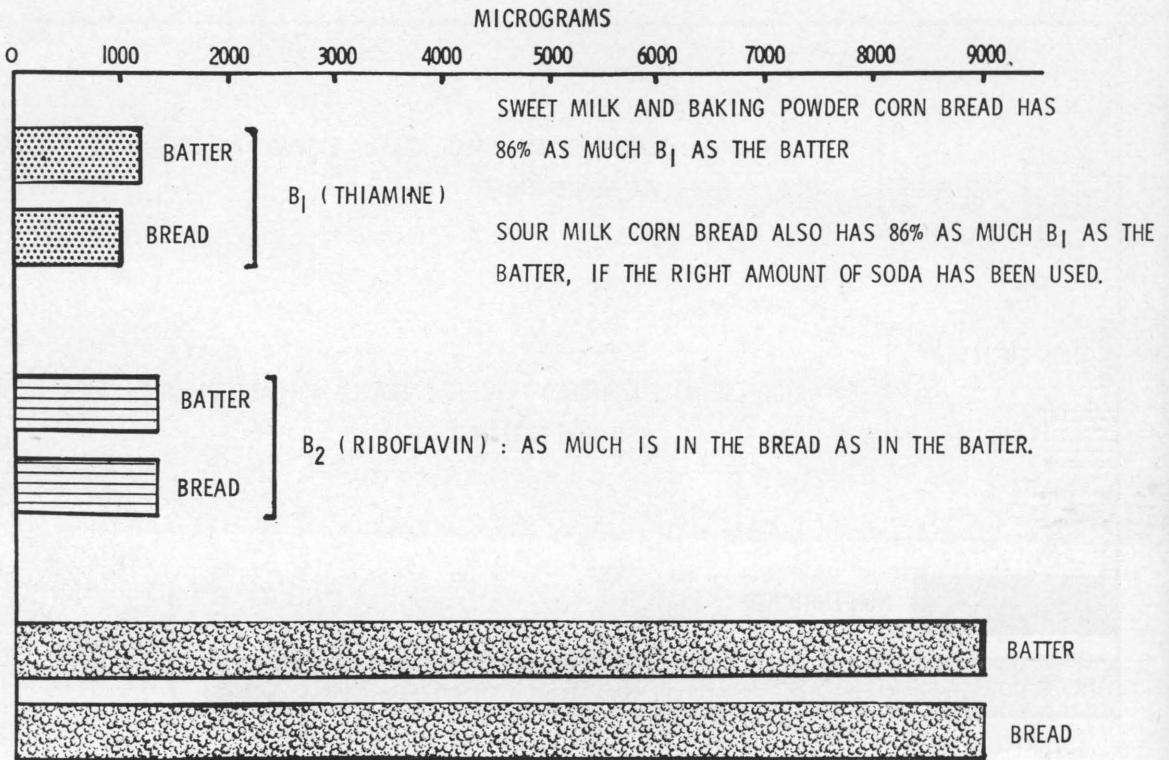
ENRICHMENT MAKES A BIG DIFFERENCE IN THE VITAMIN VALUE OF RAW GRITS.



ENRICHED GRITS HAVE 7 TIMES AS MUCH AS NON-ENRICHED

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THIAMINE IS THE ONLY B-VITAMIN LOST WHILE BAKING CORN BREAD.



NIACIN : AS MUCH IS IN THE BREAD AS IN THE BATTER

EFFECT OF BAKING POWDER AND SODA ON CORN BREAD

1. The three common types of baking powder were used: tartrate (Royal), phosphate (Rumford) and S. A. S.-phosphate (Calumet).
2. The same amount of B₁ (thiamine) was left in the corn bread with each type of baking powder.
3. Too much baking powder made the bread a dark grayish-yellow color, coarse in grain and harsh in texture. Too much baking powder did not affect the B₁ content.
4. Too much soda destroyed most or all of the B₁. There should be just enough soda to act with the acid of the sour milk.
5. Safe amounts of leavening are 1 1/2 teaspoons of baking powder to 2 cups of meal, or meal plus flour; 1/2 teaspoon of soda to 1 1/2 cups of sour milk.



Making Texas corn bread is easy.

EFFECT OF BAKING UTENSIL ON AMOUNT OF B₁ (THIAMINE) IN CORN BREAD

1. The same amount of B₁ (thiamine) was in corn bread loaves baked in tin, aluminum, pyrex and iron utensils of the same size.
2. But when the size and shape of the utensil made more crust there was less thiamine.

ONE BATCH OF BATTER MADE

1 loaf or 8 muffins or 29 sticks



618

564

474

3. The number below each product shows the total amount (micrograms) of B₁ (thiamine) in the batch.

SELF - RISING MEALS AND MIXES

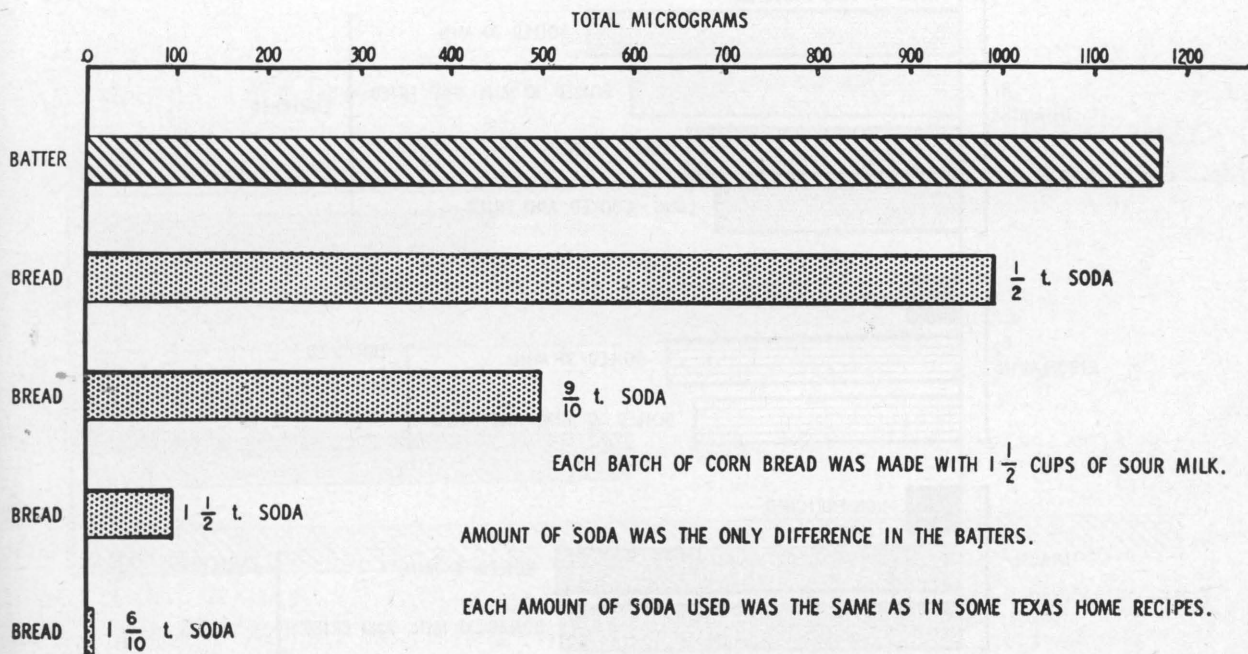
1. These commercial preparations are growing in number and popularity.
2. However, some self-rising meals and mixes leave less B₁ in corn bread and muffins than in properly made home products.
3. But with the proper kind and amount of leavening in self-rising meals and mixes, the products made from them would have as much B₁ as if all the ingredients were measured and combined in the home kitchen.

AMOUNT OF VITAMINS IN CORN MEAL AND GRITS WHEN READY TO EAT

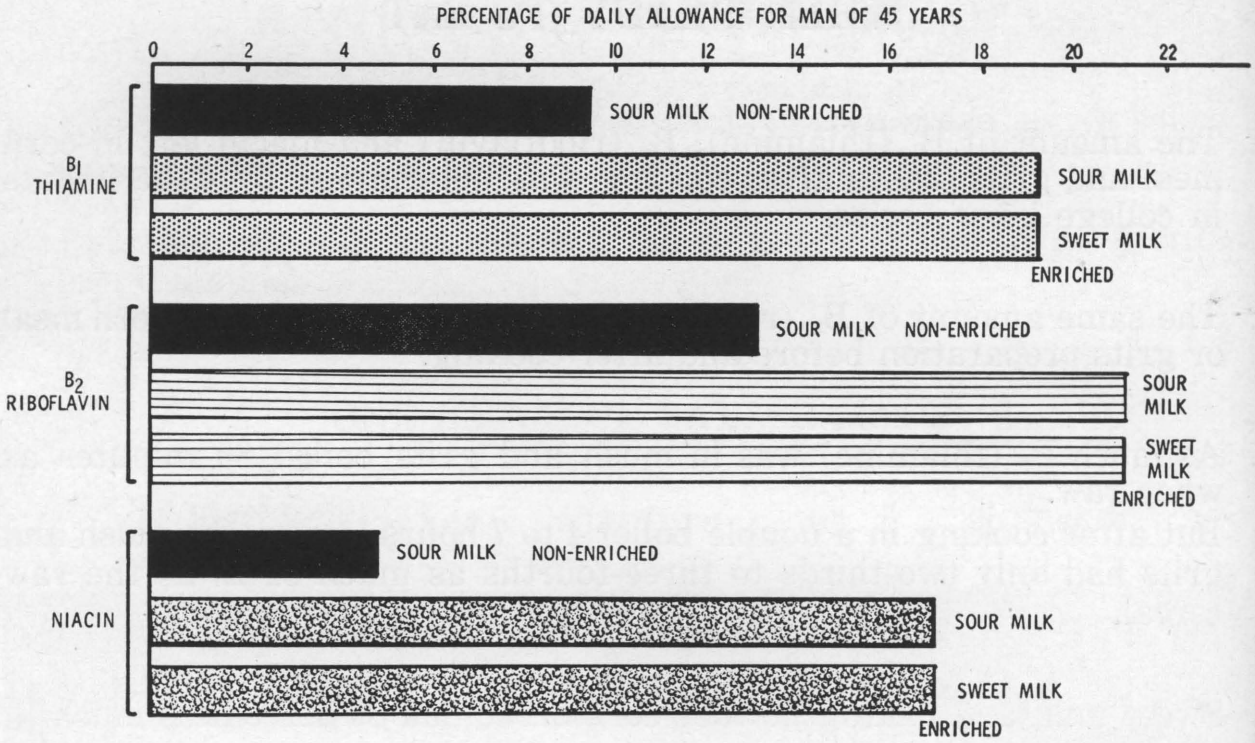
1. The amount of B₁ (thiamine), B₂ (riboflavin) and niacin left in corn meal and grits dishes after cooking was determined by experiments in college laboratories.
2. The same amount of B₂ (riboflavin) and of niacin was in any corn meal or grits preparation before and after cooking.
3. As much B₁ (thiamine) was in mush and grits boiled 30 minutes as when raw.
But after cooking in a double boiler 4 to 7 hours longer, the mush and grits had only two-thirds to three-fourths as much of B₁ as the raw cereal.
4. Sweet milk and baking powder corn bread had 86 percent as much B₁ (thiamine) as the batter.
5. Sour milk corn bread also had 86 percent as much B₁ (thiamine) as the batter if the right amount of soda was used.

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THE MORE SODA IN THE BATTER THE LESS B₁ (THIAMINE) IN THE CORN BREAD.

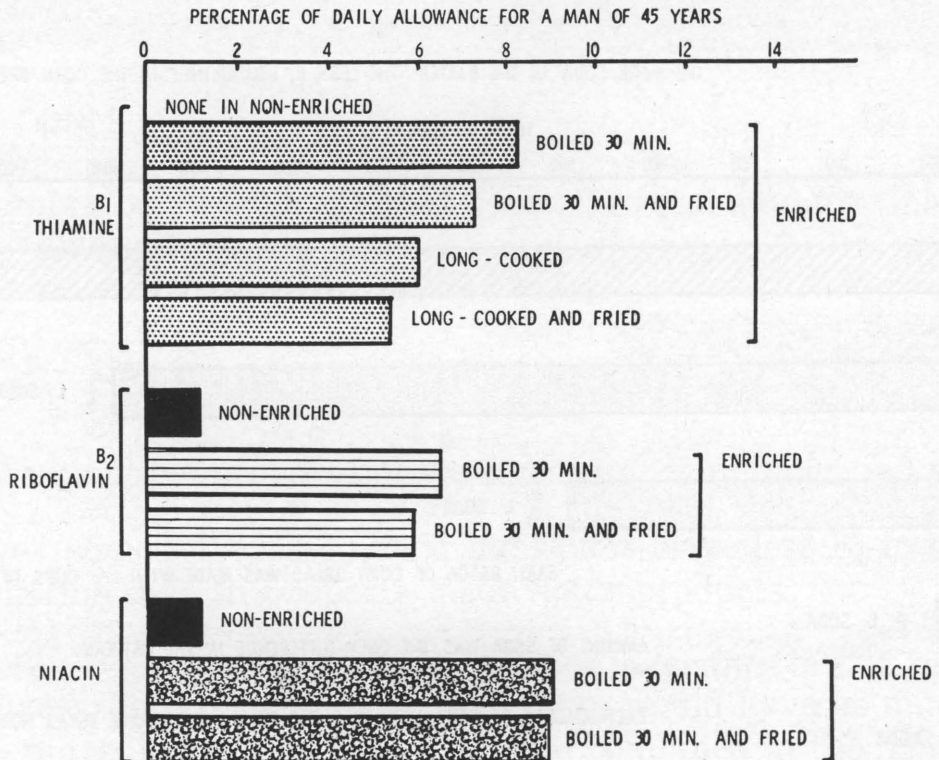


VITAMINS SUPPLIED BY CORN BREAD (4. 6 OZ.) AT ONE MEAL



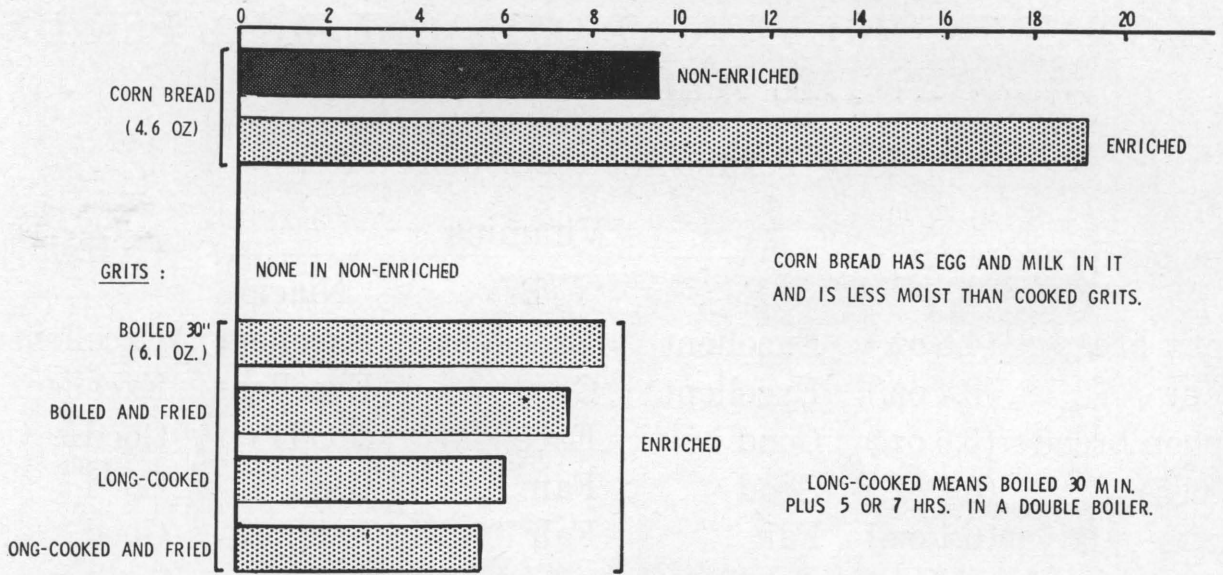
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VITAMINS SUPPLIED BY GRITS EATEN AT ONE MEAL (2 3/4 OZ. RAW)



THIAMINE FROM CORN BREAD AND GRITS SUPPLIED BY THE AMOUNT OF EACH EATEN AT ONE MEAL

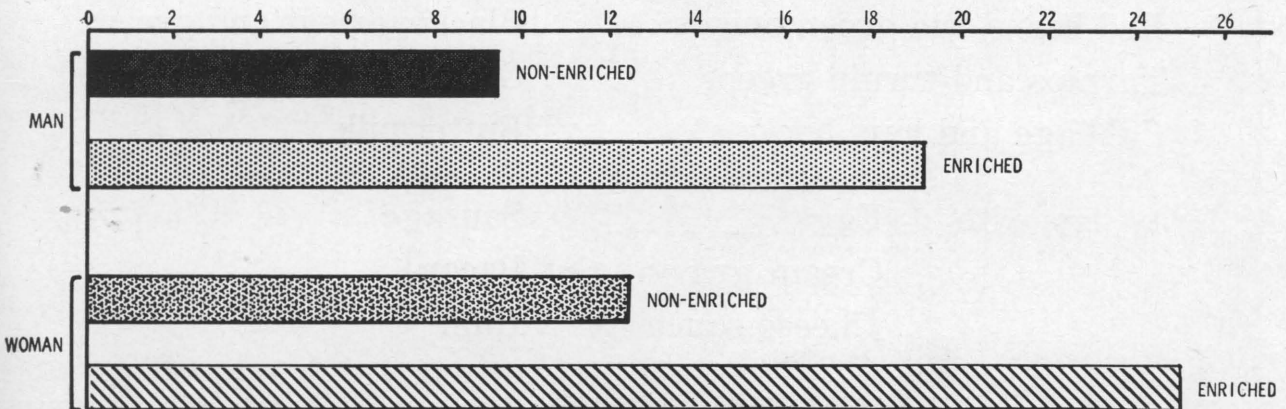
PERCENTAGE OF DAILY ALLOWANCE FOR A MAN OF 45 YEARS



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B₁ (THIAMINE) SUPPLIED BY CORN BREAD (4.6 OZ.) AT ONE MEAL

PERCENTAGE OF DAILY ALLOWANCE FOR PERSONS OF 45 YEARS



SAME AMOUNT EATEN BY A MAN AND A WOMAN.

A WOMAN'S ALLOWANCE IS LESS THAN A MAN'S.
(1.0 MG) (1.3 MG)

DIETARY RATINGS OF ENRICHED CORN MEAL AND GRITS PREPARATIONS IN COMPARISON WITH RECOMMENDED ALLOWANCES, IF EATEN AT ONLY ONE MEAL PER DAY IN THE AMOUNT INDICATED

(Many Texans eat them more often)

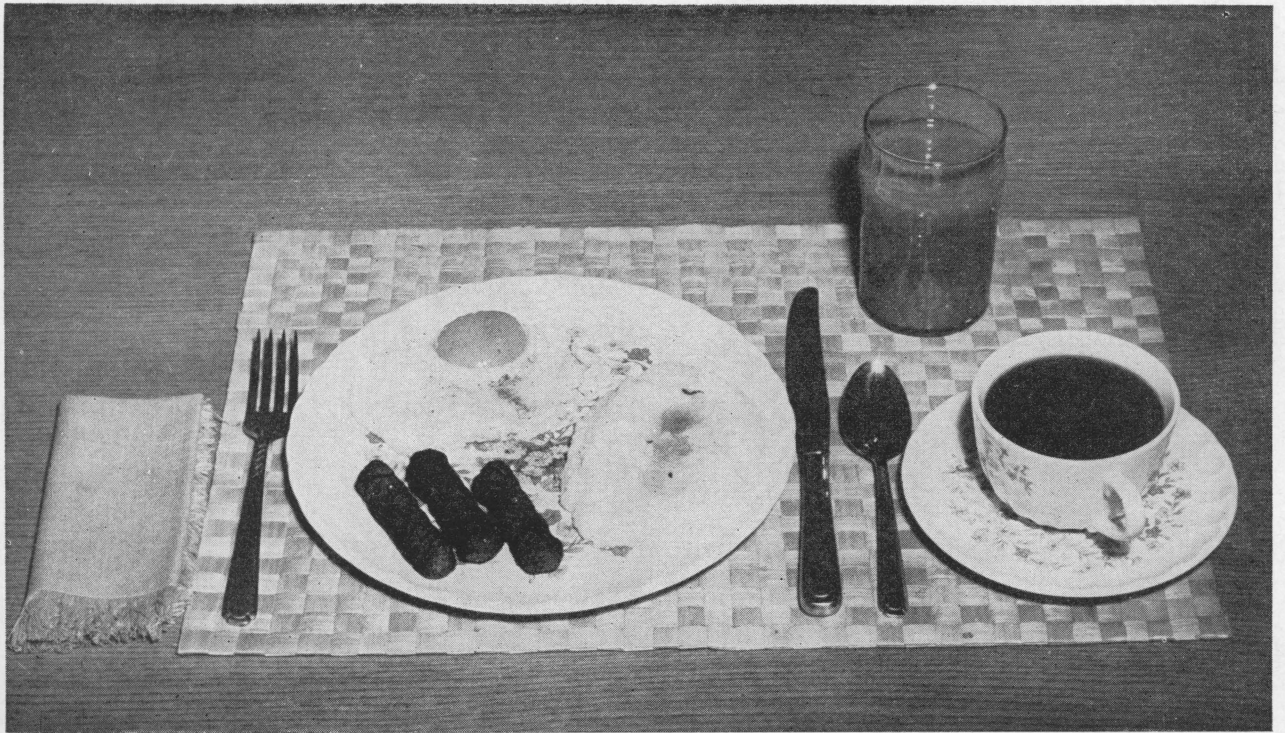
Cooked preparation	Vitamins			Iron
	B ₁	B ₂	Niacin	
Corn bread (4.6 oz.)	Excellent	Excellent	Excellent	Excellent ⁺
Pone (3.4 oz.)	Excellent	Good	Excellent	Excellent
Spoon bread (3.6 oz.)	Good	Excellent	Good	Good ⁺
Mush (6.8 oz.)	Good	Fair	Good	Good
Grits (6.1 oz.)	Fair	Fair	Fair to good	Good

DIRECT AND INDIRECT FOOD VALUE OF CORN BREAD AND GRITS

- For their own food value, enriched corn meal and grits are good foods to have in the diet.
- Indirectly, they are valuable because so often they are combined with milk and eggs in preparing various dishes, and often are eaten with certain vegetables at the same meal.
- Corn bread, according to many Texans, naturally "goes with":

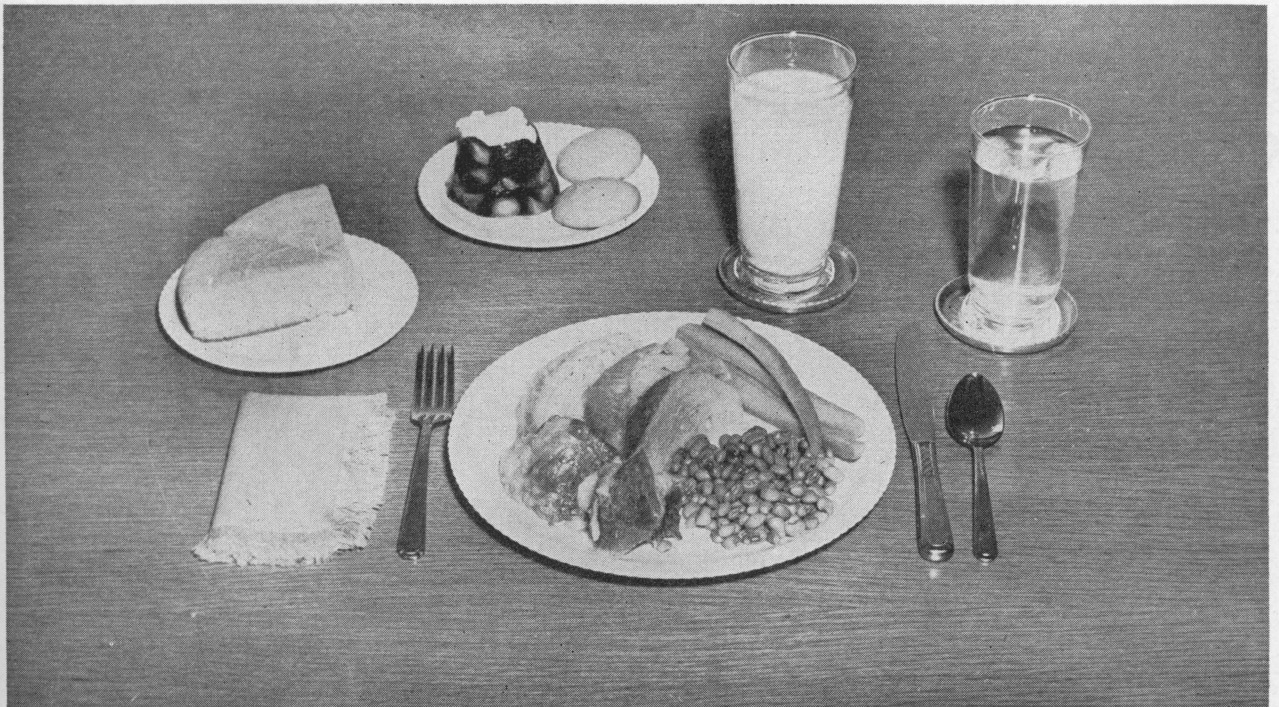
Red beans and green onions	Blackeye peas and greens
Turnips and turnip greens	Green beans and tomatoes
Cabbage and ham hock	Buttermilk
- Grits "go with":

Eggs	Sausage
Cream gravy	Bacon
Cheese sauce	Ham
- These "go with" foods supply additional minerals, some of them supply vitamins other than the B group, and others supply amino acids which are low in corn meal.



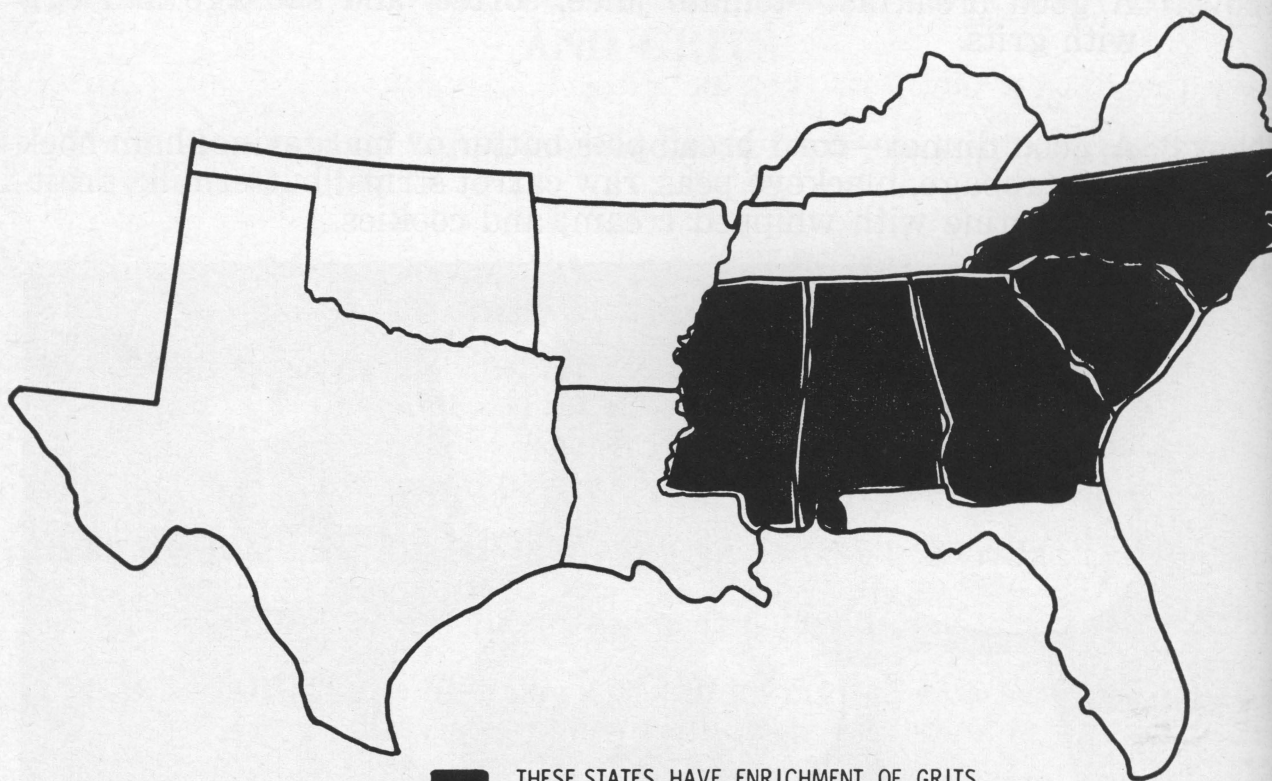
Above: A good breakfast—tomato juice, coffee, and sausage and egg with grits.

Below: A good dinner—corn bread plus butter or margarine; ham hock and cabbage, blackeye peas, raw carrot strips; buttermilk; fruited gelatine with whipped cream; and cookies.



TEXAS' FOOD SUPPLY WOULD BE BETTER IF ALL CORN MEAL AND GRITS IN THE STATE WERE ENRICHED

1. The minerals and vitamins used to enrich corn meal and grits are those most likely to be lacking in the diet of Texans.
2. Even though the lack of them is not great enough to produce nutritional diseases (B_1 , beri beri; niacin, pellagra; B_2 , cheilosis), a sufficient day-by-day supply is necessary for body processes to go on normally and for a sense of well-being.
3. Much of the corn meal now sold in Texas is enriched; but not all of it.
4. A Texas law (passed in 1943) requires enrichment of flour and oleo-margarine, but not of corn meal and grits.



■ THESE STATES HAVE ENRICHMENT OF GRITS AND DEGERMED CORN MEAL REQUIRED BY LAW

ALABAMA AND SOUTH CAROLINA REQUIRE ENRICHMENT ALSO OF WHOLE CORN MEAL AND WHOLE GRAIN GRITS.

STANDARDIZED RECIPES DEVELOPED BY THE TEXAS AGRICULTURAL EXPERIMENT STATION FOR USE IN THE COOPERATIVE STUDY ON CORN MEAL AND GRITS

SOUR MILK CORN BREAD (with flour)

2 cups corn meal	2 tablespoons sugar, if desired
1/2 cup flour	2 tablespoons fat
1 teaspoon baking powder	1 egg
1/2 teaspoon soda	2 cups sour milk
1 teaspoon salt	

Sift together the corn meal, flour, baking powder, soda, salt and sugar (if used).

Melt the fat in the pan in which the corn bread will be baked.

Beat the egg and add the sour milk; then pour this mixture into the sifted ingredients and stir only until well mixed.

Add the melted fat and stir it in.

Have the baking pan hot; then pour the batter into it.

Bake in a hot oven (400° F) for about 30 minutes.

* * * * *

SOUR MILK CORN BREAD (without flour)

2 cups corn meal	1 tablespoon sugar, if desired
1 1/2 teaspoons baking powder	2 tablespoons fat
1/2 teaspoon soda	1 egg
1 teaspoon salt	1 1/2 cups sour milk

Sift together the corn meal, baking powder, soda, salt and sugar (if used).

Melt the fat in the pan in which the corn bread will be baked.

Beat the egg and add the sour milk; then pour this mixture into the sifted ingredients and stir only until well mixed.

Add the melted fat and stir it in.

Have the baking pan hot; then pour the batter into it.

Bake in a hot oven (400° F) for about 30 minutes.

SWEET MILK CORN BREAD

2 cups corn meal	2 tablespoons fat
1½ teaspoon baking powder	1 egg
1 teaspoon salt	1½ cups sweet milk
1 tablespoon sugar, if desired	

Sift together the corn meal, baking powder, salt and sugar (if used).

Melt the fat in the pan in which the corn bread will be baked.

Beat the egg and add the sweet milk; then pour this mixture into the sifted ingredients and stir only until well mixed.

Add the melted fat and stir it in.

Have the baking pan hot; then pour the batter into it.

Bake in a hot oven (400° F) for about 30 minutes.

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SPOON BREAD

1 cup corn meal	1 teaspoon salt
2 cups cold sweet milk	¾ teaspoon baking powder
1 tablespoon fat	2 egg yolks
1 tablespoon sugar, if desired	2 egg whites

Lightly grease 1½ quart-size pyrex casserole.

Pour milk over meal; blend; cook over direct heat until thick (boiling about one minute), stirring constantly.

Add fat, sugar (if used), salt, baking powder and slightly beaten egg yolks.

Fold in stiffly beaten egg whites.

Pour into casserole and bake (without lid) at 400° F until a knife inserted from top to bottom at the center comes out clean (about 30 minutes).

CORN PONE

1 cup corn meal
1 teaspoon salt

1 tablespoon fat
 $\frac{3}{4}$ cup water

Melt fat in tin or aluminum cake or pie pan in which the pone is to be cooked.

Heat water to boiling and immediately pour over meal and salt.

Add melted fat. Stir to blend well.

As soon as mixture is not too hot to handle, divide into four equal portions. Form each portion into a pone about $\frac{3}{4}$ inch thick by patting between the hands.

Place in pan and bake in hot oven (450° F) until a light brown crust is formed (about 50 minutes).

* * * * *

MUSH

1 cup corn meal
1 teaspoon salt

3 cups water

Place meal and salt in the pan in which mush will be cooked.

Pour water over meal and salt. Stir to blend well.

Cook over direct heat, stirring constantly until the mixture has boiled 5 minutes. Then place the pan on a preheated asbestos mat and let boil slowly for 25 minutes more. Stir often enough to keep mush from sticking to bottom of pan.

Serve hot or pour into a pan or two No. 2 tin cans to cool.

* * * * *

BOILED GRITS

Same procedure as for mush except use grits instead of corn meal.

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FRIED MUSH or GRITS

Remove the mold of cold boiled grits or mush from pan or can in which the boiled product was cooled.

Cut into slices of uniform thickness ($\frac{1}{2}$ to $\frac{3}{4}$ inch).

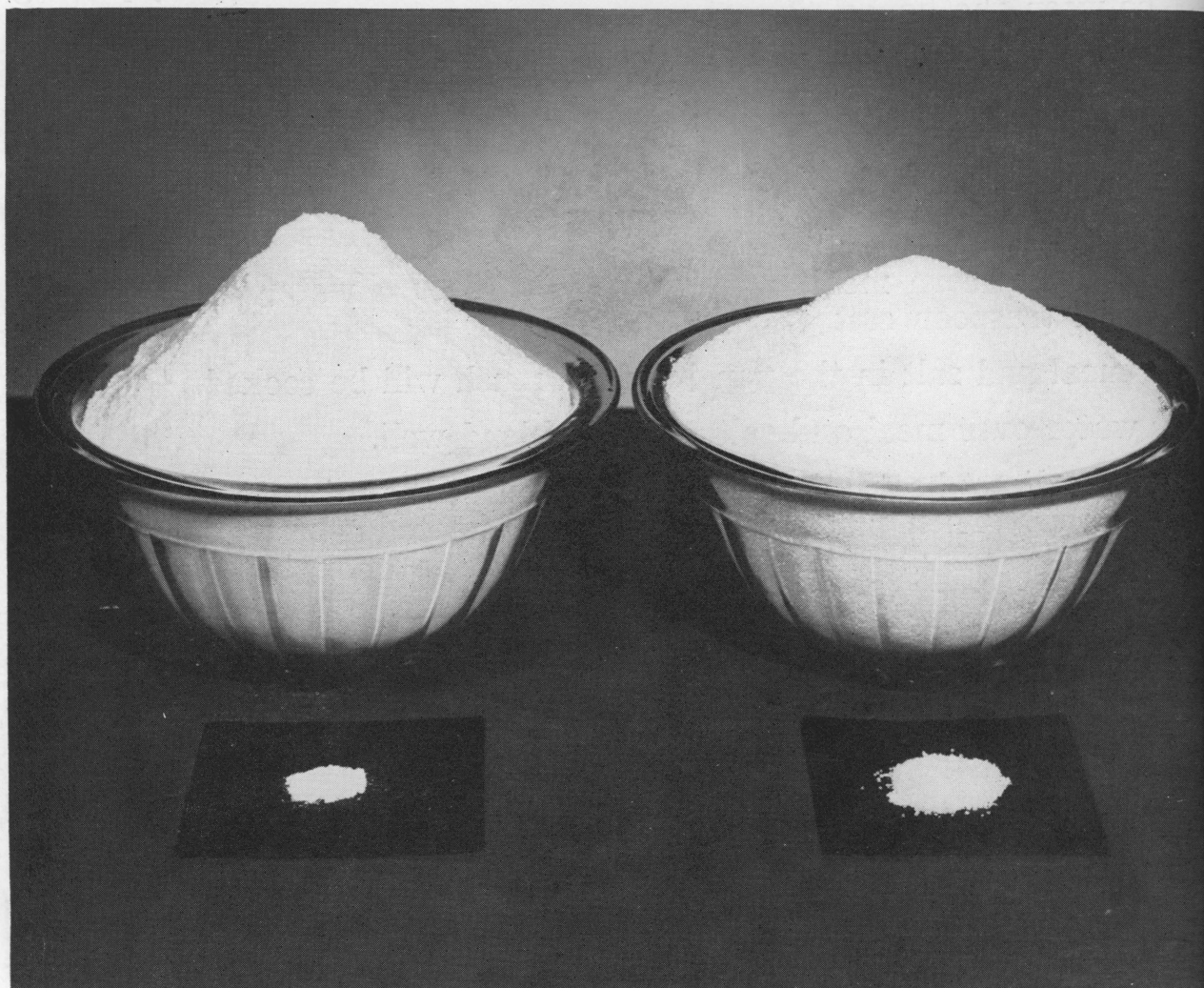
Heat $\frac{1}{2}$ to 1 tablespoon fat in skillet. Brown slices on one side; turn and brown on other side. Serve hot.

THE CONSUMER PAYS NO MORE FOR ENRICHED THAN FOR NON-ENRICHED CORN MEAL AND GRITS

Very small amounts of enriching mixtures are needed to make the B₁ (thiamine), B₂ (riboflavin), niacin and iron of corn meal and grits agree with federal standards:

One-half ounce of powder-fine vitamin mixture (Merck & Co., Inc.) for corn meal to 100 pounds of meal.

Two ounces of granular vitamin mixture (Merck & Co., Inc.) for grits to 100 pounds of grits.



At left: 5 pounds of corn meal in the bowl and the proper amount of vitamin mixture, 1/40 ounce, to enrich it.

At right: 5 pounds of grits in the bowl and the proper amount of vitamin mixture, 1/10 ounce, to enrich it.