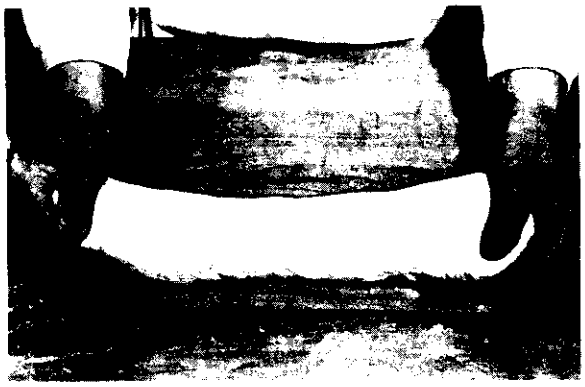
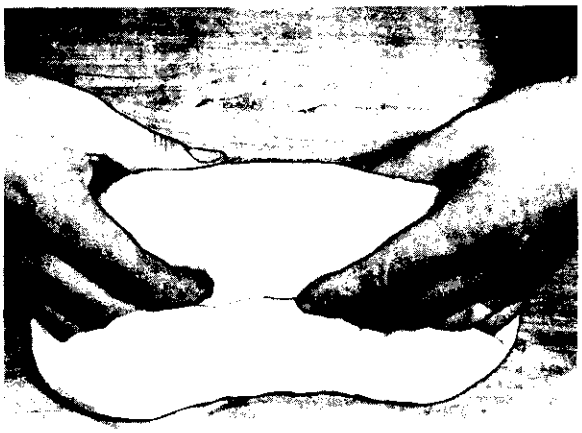
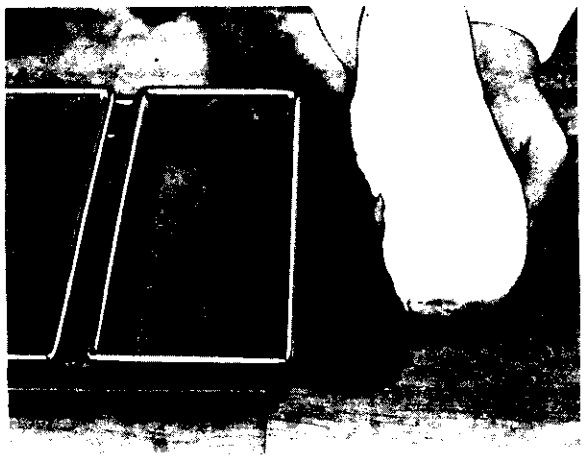


Step 1—Pulling loaf lengthwise.



Step 2—Shaping and sealing loaf.



Step 3—Rolling loaf.
Illustration 8
Molding Bread Loaf (Hand Operation)

coating that when properly applied and treated will leave minute cracks on the pan surface capable of holding small amounts of grease originating from the product being baked in the pan. Each time the pan is used for baking, the resin on the metal surface becomes quite hot and the grease carbonizes. This carbon collects and eventually the pan must be cleaned and re-glazed, but under most bakery conditions, glazed pans are good for up to 300 uses. Light greasing of glazed pans weekly will increase the number of bakes.

Pans must be straightened and completely cleaned before application of the silicone can be applied. Careful application of the glaze material followed by heating to a 90° to 100° F temperature produces the proper effect on pans. Not only does it insure greater cleanliness of pans, but bakers' uniforms and bake shop as well; and there is a decrease in the number of crippled loaves, dumping is easier, and fewer fumes are present.

608-f—PAN PROOFING THE LOAVES—After shaping and panning, loaves should be placed in a properly controlled room or cabinet called the proof box or proof cabinet, for the final or pan proof. Temperature of the cabinet should be maintained at 98° F and relative humidity at 88 percent. During pan proofing, the action of the yeast is speeded up by higher temperature and the gluten becomes more mellow and more extensible.

To determine whether the loaf is properly proofed, touch the loaf lightly with one fingertip and press in slightly. If the impression made by the tip of the finger remains, the loaf is proofed; if the imprint does not remain and fills out when the fingertip is removed the loaf is still too tight and compact and should be proofed more. Usually, 60 or 65 minutes' time is sufficient.

608-g—BAKING—The final stage in bread production is to place the pans of dough into an oven that is heated to a temperature of 425° F. This oven temperature is sufficient to heat

quickly the dough mass, and the increased temperature causes the carbon dioxide of the dough to expand, thereby greatly increasing the size of the dough. The oven temperature also vaporizes moisture on the surface of the bread and ultimately causes caramelization of the sugars, starches, and other ingredients that make up the exposed dough surface. The oven temperature and the time required to bake a loaf of bread will vary depending on the factors set forth in subparagraphs g(1) through g(5).

608–g(1)—Size and Shape of Loaf—If the loaf is large, the temperature of the oven will have to be regulated so the surface of the loaf will not burn before the loaf is baked. If the loaf is small, the temperature of the oven will have to be raised so the loaf will brown off before the crumb of the loaf is overbaked.

608–g(2)—Total Sugars in Dough at Baking Time—If the formula contains a great amount of sugars, the heat of the oven will have to be lowered so that the crust will not color excessively. If the sugar content of the loaf is low, the temperature of the oven should be raised. Dough with a high milk content (3 percent and above) will tend to make the crust color more. Bread that has a thick, hard crust has a low percentage of sugar and fat, and requires a longer baking period and higher temperature than for the regular type bread. This applies particularly to French bread.

608–g(3)—Effects Caused by Baking—Bread is the end product of a long line of chemical and physical reactions. If the loaf is removed from the oven before these changes occur, no matter what crust color is obtained, the loaf will lack desirable qualities. Color and thickness of crust is dependent upon the length of time loaf is subjected to oven temperature and the concentration of sugars. Aroma, for one thing, is "green," lacks a full-scale delicious fragrance characteristic of freshly baked bread. If sufficiently underbaked, the loaf sides will collapse and proper slicing is not possible.

Inside properly baked loaves the following conditions have taken place: (1) Cell walls are no longer sticky; (2) enzymatic and yeast action is killed; and (3) right amount of moisture is lost and loaf holds its shape.

608–g(4)—Ability of Oven To Hold Heat—Extreme baking conditions caused by size and shape, sugar content, and the condition of the oven sometimes make it necessary for the temperatures to be higher or lower.

The oven temperature may be controlled for the purpose of influencing bread character in other ways than just the color. A low oven temperature tends to open the grain of the loaf. If too high temperature is used, the loaf may burst in a rather violent manner, usually along the sides, and result in unsymmetrical loaves of minimum size.

608–g(5)—Use of Steam—Frequently, steam of low pressure (under 10 lb) is used to temper the heat in the early stages of baking. This practice may be recommended for pan bread and is very desirable for rye bread. Excess steam is objectionable because it tends to produce a shiny and tougher crust.

608–h—COOLING OF THE BAKED LOAF—The loaf should be cooled so that it will not dry excessively. Conditions which cause this excessive drying are that the air is too dry or warm in the cooling room or there is excessive air circulation in the cooling room.

608–i—STORING AND SERVING—Bread should be stored under conditions that will not dry the bread and where the temperature is cool. Bread baked for the Navy should not be held more than 48 hours. The bread storage should be arranged so that the older bread always can be used first. Sliced bread left over from a previous meal should be thoroughly dried and held to be used for breadcrumbs, bread puddings, or croutons.

745-669 O - 65 - 11

609—VARIETY BREAD PRODUCTION

In addition to plain white bread, a number of other breads are baked in the Navy general mess.

609-a—RYE BREAD—Rye bread baked for general mess use is made from a combination of medium rye flour, blended with wheat flour. On the commercial market there are four types of rye flour: light, medium, dark, and pumpernickel (or rye meal), all being made from rye grain but milled differently. There is no substitute for fresh rye flour in obtaining true rye flavor and loaf crumb color, but wheat flour must be combined with it to give strength to the dough.

If the fundamentals are understood, it is as easy to make good rye bread as it is to make good white bread. Good rye bread can be produced by either the straight dough or sponge dough method. The fresher the rye flour, the better the rye flavor and taste. The crust on rye bread makes it characteristically shiny and different from breads made from straight wheat flour. Steam gives a shine to the crust and enhances the color. If steam is not available, loaves should have a cornstarch wash as shown in the Navy-Marine Corps Recipe Service.

609-a(1)—Fermentation—A slow, cool fermentation is beneficial in developing rye flavors. Rye doughs ferment faster and require less fermentation than white doughs.

609-a(2)—Mixing Speed and Time—Mixing speed and time will be governed by the amount of rye flour in the dough. Doughs containing up to 30 percent of medium rye flour may be safely mixed at high speed, or a combination of low and high speeds. Doughs containing over 30 percent of medium rye flour are better mixed at low or medium speed. A rye dough should be smooth when it is properly mixed. Rye bread can be made successfully either by hand or machine. A molder equipped with a curling roll is best suited for making up rye bread.

609-a(3)—Proofing—The proofing of rye bread should be watched very closely. The amount of rye flour in the dough will govern the proof. The loaves are ready to load into the oven when an indentation made lightly with a finger remains in the dough. Cutting or docking of the rye loaves before loading into the oven is optional. Proof will have to be regulated accordingly. If the loaves are not to be cut or docked, give more proof before loading.

609-a(4)—Steam Conditions and Oven Temperatures—Proper steam condition and oven temperatures are necessary for the baking of rye bread. Rye bread should be baked with an abundance of low-pressure steam in the oven, especially during the first few minutes of bake. Rye loaves should be so spaced in the oven that an even bake with uniform crust thickness is obtained.

609-a(5)—Rye Bread Formulas—Medium rye bread (American) is made according to this formula:

Ingredient	Percent
Medium rye flour	35
Hard wheat flour	65
Water (approximately)	63
Yeast	2
Mineral yeast food (optional)	0.25
Salt	2.5
Sugar	3
or	
Molasses	6
Shortening	3
Caraway seed (optional)	0.75

Suspend the yeast in part of the water and place the balance of the water in the mixing bowl. Dissolve the small ingredients in the water in the mixing bowl and add the flour. Add the yeast suspension after the flour. Add

the shortening after the flour has all been wetted and the dough is formed. Mix the dough until it is smooth and elastic like a white dough. When a piece of the dough is stretched between the hands it should form a thin, almost transparent film that is free of lumps or streaks. The film will not be as strong as that made by a white dough, but should always be smooth like tissue paper, when the dough is properly mixed. The temperature of the dough when mixed should be 76° F to 78° F. The fermentation time will be approximately 2 hours to 2 hours and 45 minutes, depending on the strength of the wheat flour used and whether mineral yeast food is used.

Sour Rye Bread—The making of sour rye is no great mystery when the principles of making it are understood. Sourdough was the first leaven used in making bread; this leaven contained wild yeasts and, also, various species and types of bacteria, some of which produce gas or acids. If desirable organisms were able to gain supremacy, the leaven was a success but if the fermentation was dominated by undesirable types, the product was inferior.

Sours no longer need be depended upon as the source of leaven for bread. Today the baker uses yeast grown from pure cultures to ferment and raise the dough. The function of the sour in rye bread is to develop a specialized flavor and a more or less acid taste. If sour stocks are to be used for flavor only, various materials are available to make sours that will produce uniform products if carefully and properly controlled.[1] There are many types of dry sours, rye cultures, and rye flavors available, such as dry sours and dehydrated sours.[1]

Sours may be used with any good formula for rye bread in which acid taste and flavor are desired. Either the sponge and dough or the straight dough process may be employed. If the sponge and dough method is used, the sour usually is placed in the sponge. When sour is used in the dough, omit yeast food, diastatic malt, and any mineral which is used as rope preventive (see par. 612, "Rope and Mold Development in Bread"). Loaves made from dough in which sour has been used will have somewhat smaller volume than loaves made from the same type dough but containing no sour.

Many bakers either start sour ryes with dough saved from a previous batch or from a stock of rye flour, yeast, and water which has become sour. When using these methods control the development of the sour by keeping the temperature constant at 80° F. A uniform product will be developed if only the amount required for 1 day is made up at once.

If a lactic acid sour is wanted, buttermilk or the pure culture buttermilks sold by many milk companies will suit the purpose very well.

A medium dough is made of rye flour; 3 percent of salt based on the weight of the flour; and the liquid. The salt controls the fermentation by suppressing the growth of some bacteria while the acetic acid type is not appreciably affected. The mixed sour should be placed in a clean wooden container (a metal one will corrode) and should be held at a temperature of 80° F or lower for about 48 hours for the initial building up.

An occasional handmixing of the sour to incorporate oxygen required by acetic bacteria will help. The control of the temperature is important; just as important as is the control of temperature with yeast-raised products. One-half of the built-up sour may be used for the rye dough and the remainder brought back to the original weight with water, rye flour, and 3 percent salt (on the flour) for the next day's use.

Based on the total flour in the dough, 5 percent sour will give a mild sour taste, 10 percent a noticeably acid flavor. One part of buttermilk, or one part of the cultured milks, is diluted with one part of water as the liquid ingredient.

[1] These are not authorized for Navy use, but are included in this discussion for information.

Temperatures of 90° to 110° F favor the development of the lactic acid bacteria in milk sours, while lower temperatures of 65° to 80° F are better for acetic acid bacteria from vinegar. Lactic acid bacteria works better in a very soft or slack mixture, while acetic acid bacteria do better in a stiffer mixture.

609–b—WHOLE WHEAT BREAD—Because of its limited shelf life, whole wheat flour is not procured for the military services. A product called wheat base is used in lieu of whole wheat flour. If used at ratio of 3 lb to about 25 lb white flour in white bread formula, a very successful wheat bread can be made, because wheat base is an acceptable substitute for whole wheat flour.

609–c—RAISIN BREAD—Raisin bread requires a strong flour to carry the raisins and liberal quantities of yeast for proper fermentation and oven spring.

Formula:

Ingredient	Percent
Bread flour	100
Water (approximately)	60
Yeast	4
Mineral yeast food (optional)	0.375
Salt	2
Sugar	8
Shortening	5
Milk, dry	6
Raisins	5
Cinnamon (optional)	0.5

The dough should be mixed the same as a regular white dough with the exception that the raisins should be added at about the last 2 minutes of mixing. After the raisins are added, mix for 1 minute at low speed and about 1 minute at high. Dough temperature should be 78–80° F. If the dough is mixed too much after the raisins are added, the raisins will be mashed, and fermentation is slowed down.

If raisins are dry, soak before putting into the dough. The volume of water in relation to the raisins is of great importance in soaking. Larger volumes of water will leach out soluble solids before the raisins have become properly conditioned. The raisins should be put into enough tap water to just cover and allow to stand for 10 minutes. After 10 minutes, the raisins should be thoroughly drained and placed in a covered container for at least 4 hours. This will allow the inner portion of the raisinberry to become softened as well as the outer portion. Fermentation time 2 to 2½ hours. Make up same as regular white bread.

609–d—VIENNA BREAD—Original Vienna bread was famous chiefly for its fine flavor and taste, and thin, golden brown, and crisp crust. The use of milk in the dough, the type of flour used, and a somewhat shorter dough fermentation period seem to be the chief contributing factors for its popularity. Vienna bread is now made by either straight or modern sponge dough method, using a semirich formula. Usually, a good, strong type of flour is recommended for Vienna bread but it can be made from any good bread flour. The interior characteristics of Vienna bread differ from pan breads; the grain is more open with some holes, the crumb dryer, and texture harsher. The crust and crumb are more thoroughly baked than pan breads which accounts in part for the finer flavor and taste.

Formula:

Ingredient	Percent
Flour	100
Water (approximately)	60
Yeast	2
Mineral yeast food (optional)	0.25
Salt	2
Sugar	1
Shortening	3
Milk, dry	3

Mix the same as for regular white bread. Dough temperature 78° F to 80° F. Dough fermentation time 2¼ to 2½ hours. Scale, proof, and make up into desired shapes. To check the proof before loading into the oven, make an indentation in the dough with one fingertip.

If the indentation stays in the dough, the loaves are ready to go into the oven. If the indentation does not stay, the loaves need more proof.

To produce quality Vienna bread, the dough should be fully fermented but not overaged. A young dough will result in loaves with a tough rubbery crust while loaves from overfermented doughs will have hard, brittle crusts. Makeup is of great importance in the manufacture of hearth-baked products. A nice-appearing loaf is impossible to get if it is not made up tight or springy. Sloppy and careless molding without stretching the dough will result in a loaf which has a dead appearance; while the properly made and fermented Vienna loaf is one of the most attractive appearing loaves of hearth breads.

Vienna loaves are made up in a great variety of shapes, the most popular being the pointed and baton shapes.

Vienna bread should have almost full proof before it is placed in the oven. Usually, the loaves are given two or three or more diagonal cuts before being loaded into the oven. There are many varied cuts that can be made if time permits. Sesame or poppy seeds are sometimes sprinkled on the loaves before baking. If seeds are to be used, the loaves should be washed with water first so that the seeds will stick to the crust.

Low-pressure steam should be used freely in the oven while loading and for the first few minutes of baking. Vienna bread should be thoroughly baked. If not, all of the desirable characteristics of the finished product are lost.

609-e—**FRENCH BREAD**—Original French bread is made from a very lean formula by sourdough process. This system calls for the setting of a small sponge (starter) which, when ripe, is mixed into a sponge approximately twice as large as the original sponge. At certain periods of time, the sponge is remixed and its size is doubled with each mixing. The progressive building of the sponge continues until the desired size and age are obtained. Usually, this type of bread has a thick, hard crust and a characteristic taste. Quality French bread is now made by either straight or "modern" sponge dough, using a slightly richer formula.

The dough is allowed to ferment until it becomes sufficiently light or "poppy" for makeup, which may require up to 2 hours. The fundamental operations for French bread makeup are the same as for other breads. The dough is scaled into desired units, rounded into dough balls, and sufficient intermediate proof allowed so uniform molding is possible.

Many bakeries are producing excellent French bread with complete automatic makeup machinery, including molders. Standard molders are used for many plain varieties while for unusual shapes and styles, special-built molders are available. The primary difference in machine makeup compared with handwork is in the dough development. For machines, the dough must be fully developed in mixing and fermented slightly more to withstand the punishment. It is important to mold French bread tight without tearing the skin. To mold as firm a loaf or to force out as much of the gas as with pan bread is not necessary, because the character of the grain for this bread is open. The typical French bread is best when it has many large holes, i.e., less crumb.

French Bread—American or sweet type is made by the following formula:

Formula:

Ingredient	Percent
Flour	100
Water (aproximately)	60
Yeast	2
Mineral yeast food (optional)	0. 25
Salt	2
Sugar	1
Shortening	2
Milk, dry	2

Mix the same as for regular white bread. Dough temperature 78° F to 80° F. Dough fermentation time 2¼ to 2½ hours. Make up as described in paragraph 608. Proof the same as for Vienna bread.

Makeup—French bread is made up in many shapes and lengths, the most popular seems to be the long loaves or sticks. Usually, the French sticks are about 18 in. long for the 1-lb loaf and 25 in. for the 1½-lb loaf.

Proof Time—The modern way of proofing this type of bread is on peels that have been evenly dusted with cornmeal. The loaves are properly spaced, with seams down, on the peels. The peels are put on racks and placed in the proof box. After proofing, and just before handling at the oven, the loaves are shifted slightly on the peel so as to slide easily onto the hearth of the oven. Experience only will determine the proper amount of proof to obtain best results. Feel and appearance of the bread are the principal factors, a definite amount of time cannot be recommended.

Marking—The cutting or marking of each loaf before loading into the oven produces the desired finished appearance and variations; understanding this procedure is most important. The bread must be proofed just to the point where it will receive the cut and open slightly; not overproofed to the extent where it will recede when cut. To obtain the break and shred or lift that the so-called French bread should have, cut lightly, or just scratch the skin. This is done by holding the knife at right angles with the loaf and in practically a horizontal position, cutting with a quick motion using just the point of the knife. The most common method is to make two, three, or four diagonal cuts on the loaf. Besides the appearance, the cutting of hearth bread results in uniformity and helps prevent bursting, with increased loaf volume.

Baking—The loaves should be evenly placed in the oven and spaced sufficiently to allow the heat and steam to circulate freely around each loaf, thus preventing bursting and insuring an even bake for each individual loaf. French and most other hearth breads should be baked with an abundance of low-pressure steam. The steam should be turned into the oven a few minutes before starting the loading operation and left on until the loaves are well set and start to color. A definite baking time or temperature cannot be recommended due to the difference in formulas and shop conditions. Usually, a slow, thorough bake produces best results.

609-f—BAYONNE BREAD—Limited bakery space afloat has posed a critical need for a white bread formula for machine production which would eliminate both the intermediate proof and the final loaf molding operation.

The U.S. Naval Supply Research and Development Facility, Bayonne, N.J., resolved these problems through the development of a formula which would not only withstand the rigors of machine treatment but also be pliable enough to be "self-molding." The necessary change in production method and formulation was first predicated on a "Flying Sponge" (fast dough) bread formula. This formula, however, did not produce a satisfactory end product under these conditions. The formula was revised, the mixing time increased, and a second fermentation period prior to makeup was added to partially compensate for the lack of the intermediate proof. The net result was a modified, sponge-type dough which had the handling and production characteristics desired, and produced an excellent loaf of bread.

In addition, and of prime importance to ships without production equipment, the use of this formula means that the total batch production time can be reduced from a normal period of 5 to 6 hours to 2 to 2½ hours for a standard bread formula. In addition to eliminating the 8- to 10-minute intermediate proof, the baker can roll the rounded pieces into sausage shape and pan—one man being able to roll and pan an

average of 20 per minute. On a properly timed, 270-loaf-batch basis, 810 loaves can be produced by 2 bakers from start to finish in 5 hours and 15 minutes, or at an average production rate of 160 loaves per hour.

Following are the formula main ingredient percentages as compared to standard sponge dough percentages on a flour weight basis:

Ingredient	Bayonne Percent	Standard Percent
Flour, hard wheat	100.00	100.00
Water (variable) (total)	63.25	65.49
Yeast, dry, active	1.82	1.11
Shortening	4.70	4.87
Milk, dry, nonfat	5.13	6.19
Salt	1.82	2.43
Sugar (total)	3.63	6.86
Cornstarch	1.07	.....
Dough conditioner (optional)	0.53	.....

A dough temperature of 86° F to 88° F; a mixing time of 10 minutes each for the sponge and dough stages, respectively; and a 20-minute sponge fermentation time and 30-minute dough fermentation time is required, under 72° F ambient shop temperature to insure the desired finished product. Any increase in the bakeshop temperature will, of course, reduce the fermentation time. Due to the absence of fermentation rooms aboard ship, this control is strictly dependent upon the skill and knowledge of the baker in determining the readiness of his dough. Mixing times will not change, however, as the 10-minute periods appear to be optimum for proper dough development under practically all conditions.

Bayonne bread is most useful at sea under operating conditions wherein time and labor are at a premium and, traditionally, a good loaf of bread is desired.

609-g—CRACKED WHEAT BREAD USING BAYONNE FORMULA—This bread can be made using a short-time formula except use 4 lb of hard wheat flour instead of the 7¼ lb required in the following formula, and add 3¾ lb wheat base.

Ingredient	Percent On Flour Basis
Flour, hard wheat	100.00
Water (variable), total	73.27
Yeast, active dry	1.24
Shortening, soft	5.45
Milk, nonfat dry	6.93
Salt	2.72
Sugar (total)	7.67
Wheat base	11.68

Proceed as directed for white bread until time for the second mixing. Increase the pan proof 15 minutes over that normally required, or until loaves have doubled in bulk.

610—SCORING BREAD QUALITY

The purpose of scoring bread is to search out those factors that cause the total quality of the bread to be below standard so that the formula or the procedure can be changed or adjusted, so that these faults can be removed or reduced, and the quality of the bread improved.

610-a—BREAD CHARACTERISTICS—External characteristics of bread include all those characteristics that make up the outer part of the loaf or those characteristics that can be observed while the loaf is whole. Internal characteristics include those characteristics of the inner loaf.

It is reasonable to allow the most important bread characteristics more points toward the total 100 percent possible score than others. An example of two characteristics (one having a greater importance than the other) are: the symmetry or form of the loaf and the taste of the

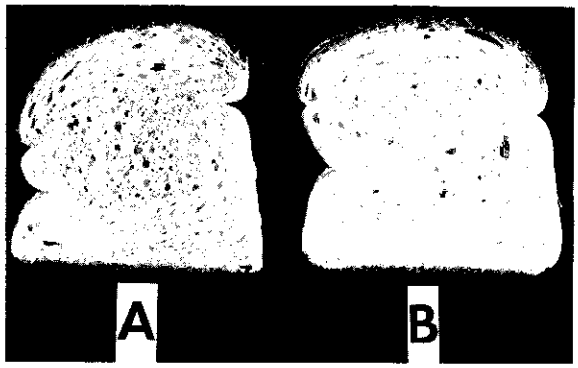
bread. Certainly the taste of the bread is more important than the shape of the loaf. For this reason, the shape of the loaf contributes 3 points, if perfect, to the total score of the loaf, while the taste is sometimes rated worth as high as 15 points, if perfect. (See table I, p. D6–44.)

610–a(1)—Volume (10 points)—The volume should be that which is most acceptable. The Navy baker will judge volume by sight as to whether it is perfect, too small, or too large. (See Illustration 9. "A Comparison of the External Characteristics of Bread.")

1. Note wild break in shred along top right side of loaf and holes in center.

610–a(2)—Color of Crust (8 points)—The color of the crust should be an appetizing nut brown. The color should be uniform and free of streaks and spots. Some bakers prefer the crust to have a shine, others prefer the color to be softer. The color of the crust should be judged by sight as to whether it is uniform, light, dark, dull, or streaked.

610–a(3)—Symmetry of Form (3 points)—Symmetry of form pertains to the general shape of the loaf. It is judged by sight as to whether the loaf has low ends, low center, flat top, protruding crust, or sunken sides. (See illustration 10, p. D6–43.)



2. Symmetry of form "A" poor, "B" good.

3. Good bread volume.

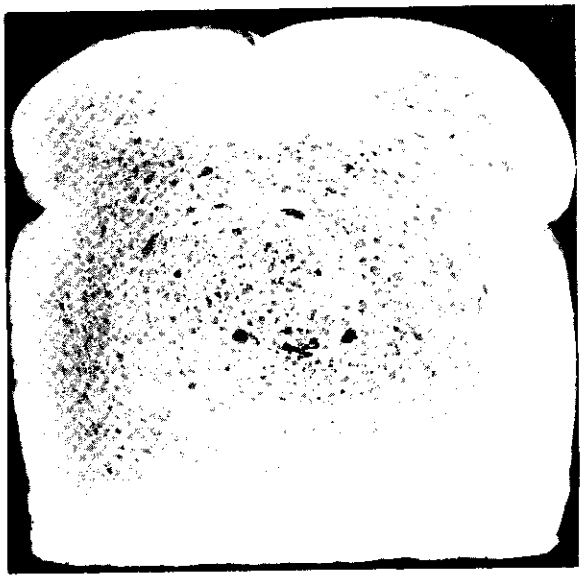
Illustration 9

A Comparison of the Internal Characteristics of Bread

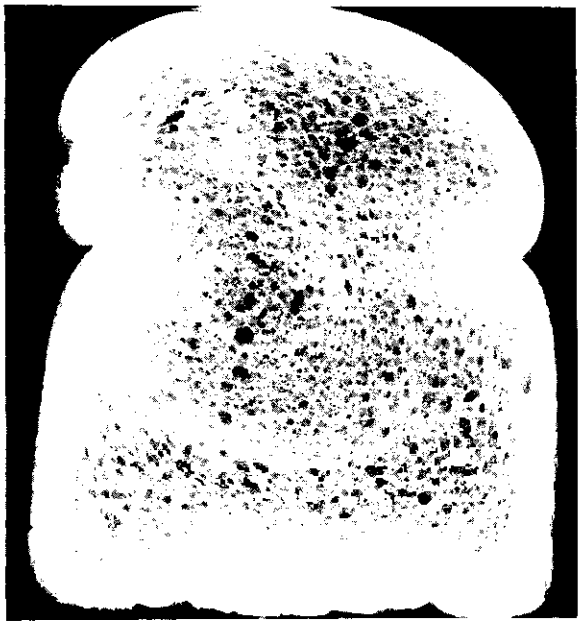
610–a(4)—Evenness of Bake (3 points)—The loaf should be evenly baked on all sides, including the ends and bottom. This characteristic is judged by sight as to whether the loaf has light sides, light bottom or top, dark bottom or top, spotted bottom, or light ends.

610–a(5)—Break and Shred (3 points)—The loaf should have a uniform break with a well-defined shred. This break and shred should be even on both sides and ends of the loaf. The break should not be excessive to the extent that the top crust separates from the side of the loaf

forming a shell crust. The break and shred is judged by sight as to whether it shows a wild break, lack of attractive shred, shell top, no break, or insufficient break.



1. Underfermented and underproofed—low volume. NOTE: Grain close—inferior loaf.



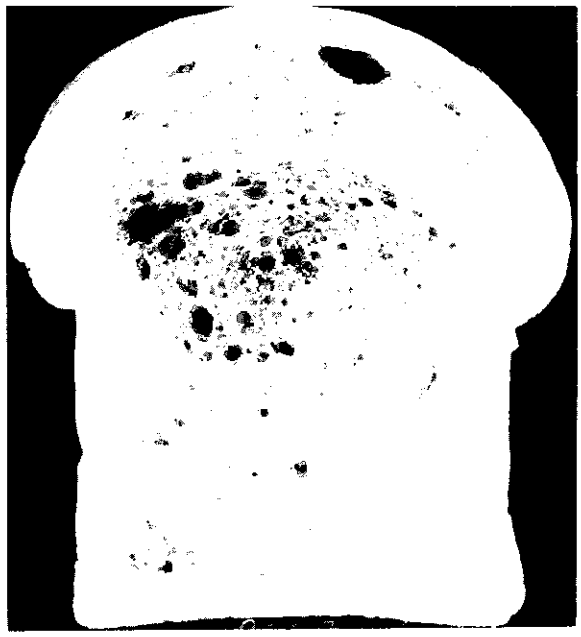
2. Normal fermentation and volume. NOTE: Uniform thin cell wall structure, cells are oval shape, not round as in 1.

610–a(6)—Character of Crust (3 points)—A good crust is thin and breaks easily, is not thin and rubbery, and is judged by sight and feel.

610–a(7)—Grain (10 points)—The grain is the structure formed by the strands of gluten and should be uniform with thin cell walls. The grain is judged by sight, and the loaf would be marked down for the following: open, coarse, nonuniform, holes, or thick cell structure.

610–a(8)—Aroma (10 points)—The aroma refers to the smell of the loaf. The aroma should be sweet, rich, and fresh, combined with pleasant wheaty or nutty aroma. The score of the loaf would be lowered for the following: strong smell, lack of aroma, musty smell, gassy smell, sharp smell, or an unpleasant or rancid odor.

610–a(9)—Color of Crumb (10 points)—The color of the crumb may vary depending on the



3. Overfermented and overproofed—large volume.

Illustration 10

A Comparison of the External Characteristics of Bread

TABLE I

SCORESHEET FOR BREAD

External	Ideal Score	Actual Score	Penalized for—			
Volume	10		Too small Too large			
Color of crust	8		Not uniform Light Dark Dull		Streaked	
Symmetry of form	3		Low end Protruding crust Uneven top Shrunken side		Low side Low middle Flat top Small end	
Evenness of bake	3		Light side Light bottom Dark bottom "Spotty" bottom		Light end	
Character of crust	3		Thick Tough Hard Brittle			
Break and shred	3		One side only Wild break No shred Shell		Insufficient None	
Subtotal	30					
Internal						
Grain	10		Open coarse Nonuniform Thick cell walls Holes			
Color of crumb	10		Gray, dark Streaky, dull			
Aroma	10		Strong, lack of Musty, sharp		Gassy Foreign	

TABLE I—Continued

SCORESHEET FOR BREAD—Continued

External	Ideal Score	Actual Score	Penalized for—			
Taste	15		Flat, salty, sour Unpleasant after-taste		Foreign	
Mastication (chewability)	10		Doughy, dry Tough, gummy			
Texture	15		Rough-harsh, lumpy Core, crumbly		Ridged, too loose Too compact	
Subtotal	70					
Total Score	100		Average score——		Actual score——	

type of bread; however, it should be bright with some luster. The surface of the crumb should present a uniform shade without streaks or dark spots. The color of the crumb is judged by sight and the score of the loaf would be lowered for the following: grayness, darkness, dullness, or streaky or spotted.

610–a(10)—Taste (15 points)—The taste of bread should be satisfying and have a pleasant wheaty taste. The score of this characteristic would be lowered as a result of any of the following: flat, sour, salty, foreign, or any unpleasant taste.

610–a(11)—Mastication (10 points)—Mastication refers to the chewability of the bread. This characteristic is judged by the feel of the bread as it is being eaten. The loaf should be free from doughiness and should not be dry or tough. The score of this characteristic would be lowered for the following: doughy, dry, tough, or grainy.

610–a(12)—Texture (15 points)—The texture or the physical condition of the crumb is judged by the sense of touch. The ideal texture is soft and velvety but should not crumble or break too easily. The score of this characteristic would be lowered for the following: rough, harsh feel, lumpiness, cores, ridges, crumbly, too loose, or too compact.

The importance of scoring the loaf is not to obtain a score for the bread; scoring the loaf is important because in this manner the baker can determine which of the characteristics are not up to standard and what steps may be taken to correct the cause. Table J, page D6–46, "Bread Characteristics," provides information on the factors which affect the score for bread.

TABLE J

BREAD CHARACTERISTICS

These Factors Affect These →	Characteristics											
	Volume	Color of crust	Symmetry of form	Evenness of bake	Character of crust	Break and shred	Grain	Color of crumb	Aroma	Taste	Miscellaneous	Texture
Flour:												
Quality	*	*	*		*	*	*	*	*	*	*	*
Age	*		*			*	*	*	*	*	?	*
Ingredients:												
Inferior quality	*						*	*	*	*	*	*
Incorrect mixing	*						*	*		*		*
Formula:												
Unbalanced	*	*			*	*	*	*	*	*	*	*
Too much or too little H_2O	*		*		*	*	*	*	*	*	*	*
Mixing:												
Over	*					*	*	*			*	*
Under	*					*	*	*			*	*
Hot dough								*	*	*		
Cold dough								*	*	*		
Fermentation:												
Young dough	*	*			*	*	*	*	*	*	*	*
Old dough	*	*			*	*	*	*	*	*	*	*
Makeup:												
Abused dough	*				*	*	*	?*	*	?*	*	*
Insufficient 1st proof	*	?*	*		?*		*	?*			*	*
Molding:												
Tight	*		*		?*	*	*	*				*
Loose	*		*		?*	*	*	*				*
Excessive dust flour		*					*	*			*	*
Improper panning			*			*						
Pan proof:												
Over	*	*	*	*	*	*	*	*	*	*	*	*
Under	*		*	*	*	*	*	*	*	*	*	*
Excessive steam		*			*	?*						
Dry	?*	*	?*		*	*						
Baking:												
Hot oven	*	*	*	*	*	*	*	*	*	*	*	*
Cool oven	*	*	*	*	*	*	*	*	*	*	*	*
Underbaked		*	*		*			*	*	*	*	*
Overbaked		*			*				*	*	*	*

611—HOT ROLL PRODUCTION

The production of bread rolls differs principally from that used in making bread in that a richer formula is used and less mixing is required. The dough usually is much softer. The significant ingredients that make richer formulas are the fat and sugar content, and in some instances, soft wheat flour is combined with hard wheat flour.

Formulas for rolls differ widely; however, regular bread dough may be used to make rolls of good quality. Basic formulas for rolls in the Navy-Marine Corps Recipe Service are as follows:

Bread-Roll Formulas

Ingredient	Standard Hot Rolls Based on Percent Flour	Quick-Raised Yeast Rolls Based on Percent Flour	Hard Rolls (Based on French Bread Formula) Based on Percent Flour	Soft Rolls (Adapted From Standard Hot Roll Recipe) Based on Percent Flour	Puff Rolls Based on Percent Flour
Flour, hard wheat	100.00	100.00	100.00	85.00	100.00
Flour, soft wheat	.....	.....	.....	15.00	.....
Water (variable), total	40.00	26.09	56.67	62.00	76.19
Yeast	1.24	2.85	1.85	3.00	4.76
Salt	1.69	2.17	1.67	1.75	0.60
Sugar (total)	9.44	9.78	2.92	8.00	9.52
Shortening	10.00	13.04	2.08	12.00	19.07
Milk	[1] 32.22	[1] 65.22	0	5.00	[2] 9.52

[1] Evaporated.
[2] Nonfat dry.

611-a—GENERAL DIRECTIONS FOR BREAD-ROLL PRODUCTION—The steps in roll production are the same as for bread production. These are as follows:

1. weighing and measuring of ingredients,
2. mixing,
3. fermenting,
4. dividing,
5. scaling,
6. rounding,
7. intermediate proof,
8. makeup,
9. panning,
10. pan proof,
11. baking,
12. cooling.

611-b—PROBLEMS ASSOCIATED WITH BREAD-ROLL PRODUCTION—The following problems are associated with bread-roll production.

611-b(1)—Temperature—As with loaf bread production, temperature control is of paramount importance. Dough temperature should remain at 80° F. Too high a temperature will cause dough to ferment too rapidly and rolls will become sour or yeasty tasting. On the other hand, too low temperature causes heavy, tough rolls.

611-b(2)—Fermentation—The amount of time needed depends upon the amount of yeast and sugar used. In quick-raised rolls, for example, about twice more yeast is used and only one fermentation period is required because there is no makeup. Proof time is only of 30 minutes duration.

611-b(3)—**Scaling and Shaping**—Makeup of bread rolls constitutes the major step in production. The variety of shapes possible with soft and hard rolls is almost endless. The most frequently used ones are described under a discussion in paragraphs 611-c and 611-d. Accurate scaling of dough and skilled manipulation of it in forming shapes is required of the baker.

611-b(4)—**Proofing**—Since rolls are considerably smaller in size than loaf bread, proofing time is very critical. The following points should be controlled:

Volume—Rolls should be proofed until about doubled in volume from makeup size.

Time Required—Under normal conditions of temperature-humidity, this will require approximately 2 hours.

Overproofing—Makeup rolls overproofed will appear blistered on the surface, appear flattened upon placing in oven, and will coarsen in texture when baked.

Other than the points discussed in subparagraphs b (1) through (4), problems in bread-roll production do not differ from those in bread production. If there is need to do troubleshooting research on roll production, consult paragraphs 604 through 607, discussing general points on mixing.

611-c—**MAKEUP OF BREAD ROLLS**—Steps in making up bread rolls are as follows:

611-c(1)—**Sandwich Rolls**—Make up as follows:

(1) Divide dough into 3-lb pieces. Round up and let rest 15 minutes. Form each piece of dough into a rope 1 in. in diameter.

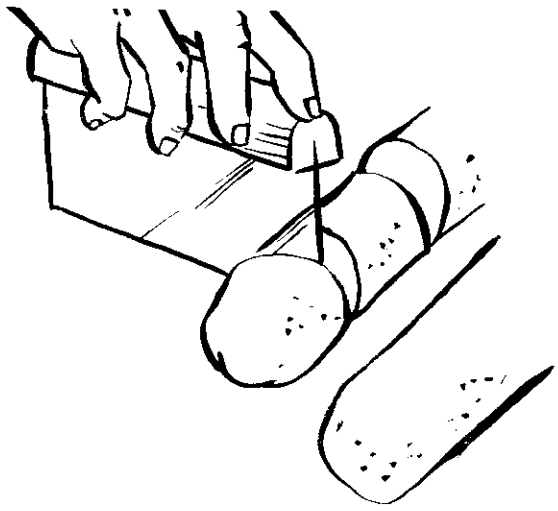
(2) Cut strips of dough into pieces weighing approximately 2 oz each. (See illustration 11, step 1.)

(3) Round the 2-oz pieces into balls by rolling them with a circular motion on the workbench. (See illustration 11, step 2.)

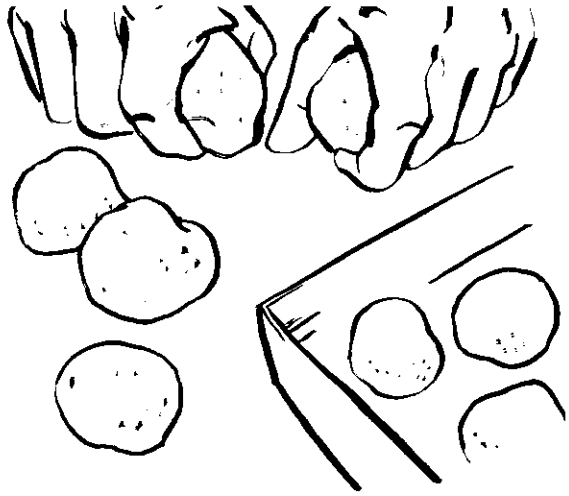
(4) Place rolls in rows on a greased baking sheet 1½ to 2 in apart.

(5) Proof for 15 minutes.

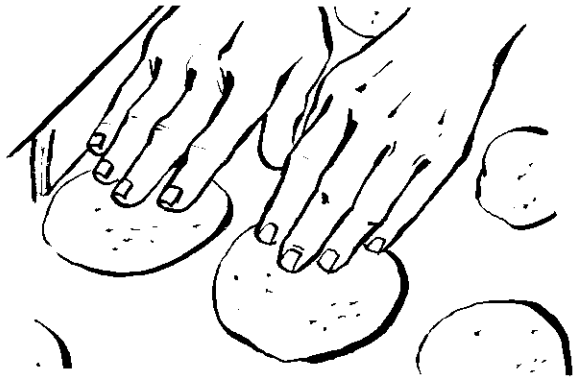
(6) Flatten rolls with fingers or small can to the desired thickness and finish proofing. (See illustration 11, step 3.)



Step 1—Cut strips of dough.



Step 2—Round into balls.



Step 3—Flatten and finish proofing.

Illustration 11
Makeup of Plain Rolls

611–c(2)—Pan Rolls—Proceed as for sandwich rolls, except scale 1½ oz of dough and omit step 6.

611–c(3)—Wiener (or Finger) Rolls—Make up as follows:

(1) Divide dough and roll into strips as for sandwich rolls.

(2) Cut strips of dough into pieces weighing approximately 1½ oz each. (Use only 1 oz of dough for finger rolls.)

(3) Round dough slightly and roll into pieces approximately 4½ in long.

(4) Place rolls in rows on a greased baking sheet ½ in apart.

611–c(4)—Parkerhouse Rolls—Make up as follows:

(1) Divide and roll dough as for sandwich rolls.

(2) Cut strips into portions weighing approximately 1¼ oz (1 in thick).

(3) Shape dough into balls by rolling with a circular motion on workbench.

(4) Allow balls to rest for 10 to 15 minutes.

(5) Elongate with small rolling pin. Crease rolls across center with hand, dull edge of knife, or rolling pin. Brush with melted fat. (See illustration 12, step 1.)

(6) Fold roll on crease and press together with palm of hand. Place rolls in rows on greased baking sheet about ½ in apart. (See illustration 12, step 2.)

611–c(5)—Butter Biscuits—Make up as follows:

(1) Form a dough strip as for plain rolls.

(2) Divide dough into 8-lb pieces.

(3) Roll each piece into ⅓-in thickness.

(4) Brush on melted shortening or butter.

(5) Fold the dough to make two layers.

(6) Roll to ½ in.

(7) Dock the dough.

(8) Cut into rolls with a floured cutter. (See illustration 13.)

(9) Place on a greased baking sheet approximately ¼ in apart.

611–c(6)—Cloverleaf Rolls—Make up as follows:

(1) Roll 3-lb piece of dough into a rope approximately 1 in in diameter and cut into pieces 1½ oz each.

Step 1—Elongate with a small rolling pin.

Step 2—Fold on crease and press together.

Illustration 12
Shaping Parkerhouse Rolls

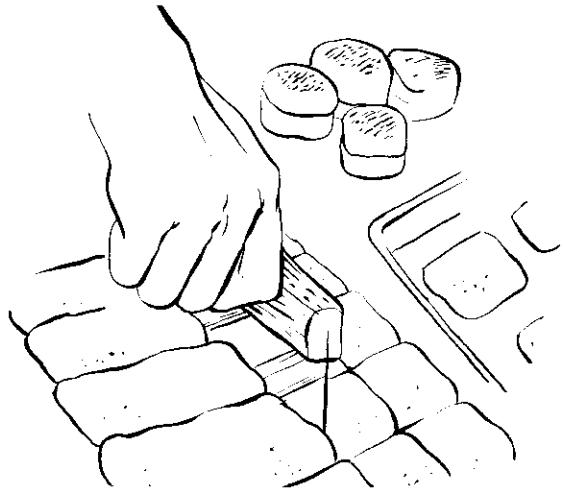


Illustration 13
Cutting Butter Biscuits

(2) Divide each small piece of dough into thirds and shape in small balls.

(3) Place into oiled muffin pans allowing three balls for each cup, as shown in illustration 14.

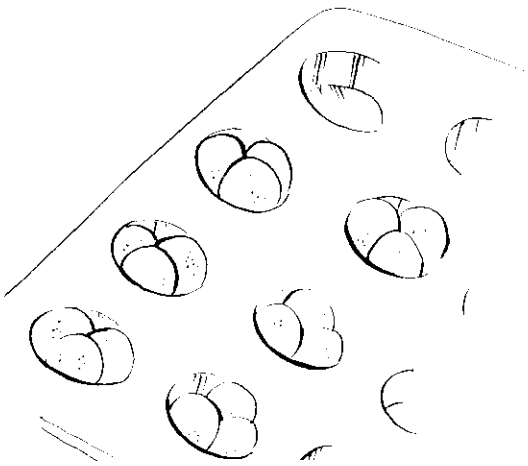


Illustration 14
Panning of Cloverleaf Rolls

611–c(7)—**Twin Rolls**—Proceed as for cloverleaf rolls but allow only two balls for each cup.

611–c(8)—**Butterhorn Rolls**—Make up as follows:

(1) Roll dough into a 9-in circle or a thin rectangular sheet.

(2) Cut circle into eight wedge-shaped pieces or cut sheet of dough into triangles.

(3) Brush with melted butter. Begin at base, roll each triangle keeping point in middle of roll. Place on greased baking sheets 1¼ in apart. (See illustration 15.)

611–c(9)—**Crescents**—Proceed as for butterhorn rolls and bring ends of butterhorn toward each other to form a crescent shape.

611–c(10)—**Poppyseed or Sesame Seed Rolls**—Shape as for twin rolls, braids, or pinwheels. Brush with egg wash or milk after panning and sprinkle generously with seeds.

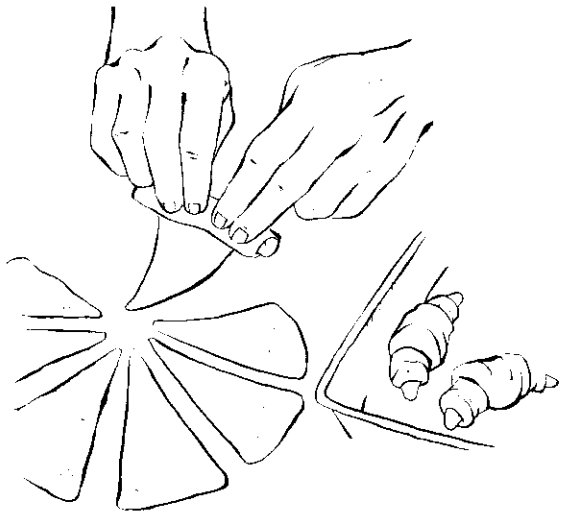


Illustration 15
Butterhorn Rolls (roll each triangle from base, keeping point in the middle)

611–c(11)—**Butter Pinwheels**—Make up as follows:

(1) Roll out a 5-lb strip of dough into a rectangular sheet about ¼ in thick.

(2) Spread with creamed butter.

(3) Roll dough as for jellyroll, cut into slices ¾ in thick.

(4) Place (cut surface down) on greased baking sheet ½ in apart.

(5) Brush top with melted butter.

611–d—**SPECIAL ROLL PRODUCTION PROCESSES**—Special roll production processes are as follows:

611–d(1)—**Short-Time Roll Formula**—Three recipe variations of white rolls, cracked wheat rolls, and brown-and-serve rolls are possible with the short-time Bayonne bread formula described in paragraph 611–c. The 2½ hours saved in preparing standard white bread holds true also in preparing rolls. About 1½ hours preparation time per batch of hot rolls is saved

if you use the short-time formula in lieu of the straight dough method. Note the few simple adjustments required to make the short-time, white bread formula into rolls.

611–d(2)—Brown-and-Serve Rolls—Makeup: Follow procedure described for plain rolls, paragraph 611–c, for cutting and shaping. Proof: Approximately 30 minutes (¾ proof). Bake: Bake at 300° F for 12 to 15 minutes or until the first sign of color.

NOTE: Hold partially baked rolls in refrigerator at 40° F for up to 1 week; if freeze space is available, these rolls freeze satisfactorily. Finish baking at 425° F approximately 12 minutes.

611–d(3)—Bread Rolls Made From Retarded Doughs—Retarded doughs are those that are mixed up ahead of need, the dough is kneaded and allowed to undergo one fermentation after which they are punched to release gas, closely covered, and stored at refrigerator temperatures until needed. If an appreciable amount of gas has expanded the dough during storage, then it must be punched down while still in refrigeration to release the gas. Enough gas may form to require several punchings, so the dough should be checked every few hours.

When needed, the entire dough mass, or that amount required, is removed from the refrigerator, shaped into rolls, and pan proofed until doubled in bulk.

Most bread or roll dough formulas can be held in the refrigerator up to 48 hours before baking if temperatures are carefully controlled. Yeast action will become inactive at 38° to 42° F, but dough must not be subjected to lower temperatures. Too much gas formation is characteristic of doughs held above 42° F.

However, better quality rolls are produced if yeast in roll formulas is adjusted for retarded dough use because overfermentation may result. In doughs to be held over 48 hours an additional sugar will be required to furnish the yeast food.

611–d(4)—Hard Rolls—The quality most sought after in hard rolls, like that in French and Vienna breads, is crispness of crust. To obtain this flavor, hard rolls must be thoroughly fermented or well aged because young dough produces tough, rubbery crusts. Use of a strong flour is necessary for properly fermented or aged dough. About 1½ hours should be allowed before first punch, and ¾ hour for second. Varieties of hard rolls are round, French, Vienna, and seed.

Procedure for hard-roll production is as follows:

1. Use any French-bread formula, ferment as directed;

2. Scale dough into 3½ to 4½ lb;

3. Round and let rest 10 to 15 minutes;

4. Flatten and cut into rolls (by hand or roll divider) and shape up in any one of the varieties described in paragraph 611–c;

5. Allow to rise until double in size;

6. Bake hard rolls at 450° F. Use of steam to saturate oven is desirable to allow the dough surface to expand and convert starch to dextrose which causes better browning.

611–d(5)—Cracked Wheat Rolls—Substitute 3¼ lb wheat base and 4 lb sifted, hard wheat flour for 7¼ lb sifted, hard wheat flour.

Makeup: For cutting and shaping rolls, follow the procedure for making plain rolls, paragraph 611–c.

Proof: 45 minutes at 90° F or until double in bulk.

Bake: Bake at 425° F about 15 minutes.

745-669 O - 65 - 12

612—ROPE AND MOLD DEVELOPMENT IN BREAD

The baker is faced with two detrimental factors that may become apparent in the bread during its storage; these are rope and mold development. Because of these factors it is most important that the storage of the bread be planned so that no longer than 48 hours lapse before issue.

"Rope" is an infection of bread caused by development of spores of the subtilis-mesentericus group of bacteria. The symptoms of this disease are the development of a distinctive sickly sweetish odor similar to cantaloupe, together with the appearance of yellowish-brown spots in the crumb which feel sticky to the touch. As the disease progresses, the crumb becomes so soft and sticky that, when touched, it can be pulled out into long threads, hence the name, rope.

Mold is a spore that infects bread under the conditions of right temperature and humidity. Spore sacks develop that show multiple discolorations on the sliced surface of bread. A discussion of sanitation measures to control rope and mold will be in Section E, "Storage and Care of Subsistence Items," to be published at a later date.

If desired, a mold-preventive product called INHIBITOR, MOLD, Bread, Rolls, and Pastry Products (Class 8950) can be added to the list of ingredients. Read the label on the product to determine the amount to use.

613—SWEET DOUGH PRODUCTION

Among the various yeast-raised doughs being made in bakeries, sweet dough is one of the most common. Sweet dough, as the name implies, should be sweet and made from a formula high in sugar, shortening, eggs, and other enriching ingredients. Sweet doughs are used to make a variety of breakfast rolls and coffeecakes.

613-a—INGREDIENTS—A study of the function of the ingredients and the percentage range of these ingredients in the various formulas follows:

613-a(1)—Flour—The flour used in producing sweet goods can be almost any grade, separation, or extraction of hard wheat used alone or by blending with other hard or soft wheat flours. Soft wheat flours may be blended in with the harder flours, in proportions given in recipes in the Navy-Marine Corps Recipe Service.

There are reasons why blended flour or straight flours are used in sweet dough formulas. The use of soft wheat in straight dough production hastens fermentation, the degree being dependent upon the amount incorporated in a recipe. The fermentation period must be longer when 100 percent hard wheat flour is used in order to condition the wheat protein properly. It is for this reason that when making retarded doughs, stronger flours are essential. The added strength is needed to withstand the acids developed even though yeast activity is halted.

If a shorter fermentation time is needed, soft wheat flours may be blended with the harder wheat flours softening the flour and shortening the conditioning time needed. The big disadvantage of this is that the soft flours shorten the bench or makeup tolerance considerably. If the dough can be handled with the shortened tolerance, the finished roll usually is more tender and has a better texture.

613-a(2)—Sugar—The most common sugar used is sucrose, or ordinary granulated sugar. Very often, other forms of sugar are used or added for their individual characteristics; namely, honey, malt, or molasses is used for the flavor imparted as well as sugar content and the

help given in retaining moisture in sweet rolls. Corn sirup is used also to help retain moisture. Corn sirups can be used in relatively high amounts without causing any ill effects.

Sugar ranges from 10 percent to 25 percent in formulas depending upon the product made. When rolls are made with only 10 percent sugar they are very close to a bun or soft roll and have good tolerance, are easy to make up, have good volume, and in many ways are superior to others. The main fault is that the rolls are lacking in sweetness and richness. Rolls made with 25 percent sugar have shortened tolerance, longer fermentation, smaller volume, and increased cost, but are sweeter, more tender, and better keeping rolls. The best range for the sugar in sweet dough is considered to be 14 percent to 20 percent; this gives a roll sweetness enough to the taste without the disadvantages of the richer units.

613–a(3)—Shortening—Fats can be used in amounts ranging from 8 percent to 30 percent. When using only 8 percent of fat, rolls will not be as tender as they should be, and when using 25 percent to 30 percent the texture will be greasy, with some of the fat baking out of the rolls onto the pans. Using 14 percent to 20 percent of fat gives the most desirable rolls—tender, but not greasy; short, yet not lacking in volume.

613–a(4)—Eggs—Whole eggs, or egg yolks may be used in amounts ranging from 8 percent to 30 percent depending upon the type used and the finished product desired. The interior color of the roll does not give an indication of the amount of eggs used. When increasing the amount of whole eggs in rolls, the color change is slight and above 15 percent is hardly noticeable. The optimum amount of whole eggs to use falls within the ranges of 10 percent to 24 percent, keeping the cost down yet obtaining all the benefits possible from the use of the eggs.

613–a(5)—Milk—The use of milk is recommended for all sweet dough formulas for the increased tolerance it gives to fermentation and makeup. Fluid milks, whole, may be used if properly heat treated. Evaporated milk may be used. Dry milks are the most popular of all the milks used; either whole or nonfat dry milk used in amounts of 8 percent to 10 percent yields a very favorable product.

613–a(6)—Yeast—The yeast cannot do its work uninhibited as it does in many other doughs, because of the high concentration of sugar present. Sugar slows the yeast action; usually, this is offset by using higher amounts of yeast. The amounts of yeast to use range from 3 percent to 9 percent, depending upon the richness of the formula. The use of higher amounts of yeast will shorten the fermentation and bench tolerance of the dough and, if not taken into consideration, will result in old doughs.

613–a(7)—Flavors and Spices—Spices are used to add variety and flavor to the baked product. Care should be exercised in the selection and amount of spice used. The addition of spices to a dough mixture do not materially affect the rate of fermentation if used in quantities specified in formulas. Excess flavoring extracts are undesirable.

613–b—FORMULAS FOR SWEET DOUGHS—The basic formula for a sweet dough can have many variations depending upon customer preference, bakery conditions, handling, and cost of ingredients.

Sweet dough formulas may be rich or lean, according to the percent of eggs, shortening, sugar, and milk solids used. With increased quantities of these ingredients in a formula, yeast is likewise increased to induce the necessary leavening action.

Sweet dough formulas in the Navy-Marine Corps Recipe Service vary according to product use, as shown on page D6–54.

Ingredient	Basic Sweet Dough (Based on Percent Flour)	Coffee-cake (Based on Percent Flour)	Danish Pastry (Based on Percent Flour)	Kolaches (Based on Percent Flour)
Flour, hard wheat	100.00	100.00	66.67	100.00
Flour, soft wheat	.....	.....	33.33	.....
Water	53.17	53.17	.....	8.33
Yeast, active dry	3.17	3.17	[2] 11.11	4.17
Salt	1.50	1.50	4.00	1.50
Sugar	16.67	16.67	16.67	20.83
Shortening	18.83	18.83	16.67	20.83
Milk, nonfat dry	5.00	5.00	[1] 47.78	[1] 53.83
Eggs	18.83	18.83	22.22	16.66
Other:				
Vanilla	.17	.17	.22	.....
Mace	.17	.17	.....	.....
Cinnamon	.....	.....	.22	.....
Nutmeg	.....	.....	.22	.....

[1] Liquid, whole milk.
[2] Compressed yeast.

In addition, formulas for sweet doughs, coffeecake, and Danish pastry may be altered to accommodate a set of shop conditions or ingredient limitations.

For example, some installations have insufficient space for the required fermentation of large batches of dough. In order to avoid bottlenecks, smaller batches can be made in which fermentation action can be speeded up. This can be done by varying the ingredients, as indicated by the following general rules:

1. Increasing the amount of yeast,
2. Substituting soft wheat flour for a part of the hard wheat flour,
3. Decreasing salt and sugar content to allow the yeast more freedom so that it can work faster.[3]

[3] Use in the case of straight-dough production only.

On the other hand, if hard wheat flour is the only type flour on board, it may be necessary to alter the formula for Danish dough accordingly. These general rules discussed above are reflected in the following alternate formulas for basic sweet dough, coffeecake, and Danish pastry:

Ingredient	Basic Sweet Dough Based on Percent Flour	Coffeecake Based on Percent Flour	Danish Pastry Based on Percent Flour
Flour, hard wheat	76.00	80.00	100.00
Flour, soft wheat	24.00	20.00	.....
Water (approximate), total	54.00	57.00	58.00
Yeast, active dry	6.00	6.00	5.00
Salt	1.00	1.25	1.00
Sugar	12.00	10.00	14.00
Shortening	15.00	12.00	12.00
Milk, nonfat dry	5.00	4.00	3.00
Eggs (by weight)	13.00	10.00	10.00
Other: Malt	1.00	.....	.....

613–c—TYPES OF SWEET DOUGH—There are two types of sweet dough, regular sweet dough and roll-in sweet dough (or Danish dough). Products made from any of these doughs may be similar in size, shape, and weight but will differ considerably in texture. The fine, even grain and texture of regular sweet dough items is quite different from the flaky texture of the roll-in dough products. In large-scale operations it is not the usual practice to make a special roll-in sweet dough for coffeecakes, since excellent coffeecakes are made from a good, rich, sweet dough and regular Danish dough will meet all needs for flaky items. These kinds of sweet dough can be handled as either doughs with normal fermentation and makeup or as retarded sweet doughs.

613–d—SPECIAL POINTS IN MIXING SWEET DOUGH—When dry milk products are used, the dry milk may be sifted with the flour, but it is better to reconstitute the milk with ¾ of the water to be used before the flour is added. The yeast should be dissolved in the remainder of the water. A sweet dough containing eggs can appear very slack without being sticky; however, eggs improve the handling of the dough. The fermentation period of a sweet dough should not be long enough to allow the dough to develop excess acidity.

The mixing of a sweet dough is no more complex than the mixing of any other yeast-raised dough. Mixing can be stopped as soon as all ingredients are properly blended or it can be continued until the dough is properly developed; this will be determined by the way the dough is to be handled after it is mixed. For example: if the dough is going to be made into a roll-in sweet dough it will not need to be developed in the mixer because it will get its development from the rolling-in process and makeup. But if the dough is going to be made up after just a short rest (or floor time) then it should be developed in the mixer.

True, one does not wish to develop a strong sweet dough, but good results will be obtained if enough water or liquid is used to permit the

dough being mixed to be smooth. Caution must be exercised to avoid developing the dough until it is elastic or problems of makeup will result. In this operation, a nice balance of liquid and mixing must be attained to yield high-quality products.

613–e—SWEET DOUGH PROCESSES—Very good sweet dough can be made by either the straight dough method or the sponge dough method. Both methods have advantages as well as disadvantages.

613–e(1)—Mixing a Straight Dough—When mixing a straight dough, place sugar, salt, and shortening in mixing bowl and mix 1 minute at second speed. Dissolve yeast in water, add eggs and milk, and blend with first mixture. Add sifted flour and flavoring and mix approximately 4 minutes or until a smooth dough is formed. (See par. 604 for additional information on mixing straight doughs.)

613–e(2)—Mixing a Sponge Dough—The sponge can be made from flour, water, and yeast only or it can be enriched by adding all or part of the various ingredients such as sugar, shortening, mineral yeast food, malt, eggs, or whatever is desired. The sponge is mixed smooth and allowed to ferment. (See par. 604 for additional information on mixing a sponge dough.)

For a remix of sponge dough, dissolve small ingredients in the dough water. Add fermented sponge and part of the flour, breaking up the sponge to avoid streaks. Add balance of flour and shortening and complete the mixing process.

613–f—FERMENTATION—The manner in which the dough is to be handled after it is mixed should determine the temperature of the dough from the mixer. If the dough is to be given normal fermentation, floor time, and makeup, it should come from the mixer at 78° to 82° F. If the dough is to be made up into Danish dough (i.e., mixed, divided into suitable-sized pieces, have the additional shortening rolled in, and then be retarded in the retarding box), then the dough should leave the mixer at 60° to 65° F. The factors to be considered in the control of sweet dough temperature are the same as for bread doughs. (See par. 606.)

The fermentation tolerance of sweet doughs is less critical than the fermentation tolerance of bread doughs and, therefore, it is common practice to adjust the fermentation time considerably according to the time required for makeup. Because the makeup time for different types of sweet rolls and coffeecakes varies so much it is better to keep the dough on the young side and, thus, get longer bench tolerance.

613–f(1)—Normal Fermentation—Normal fermentation for basic sweet dough, roll-in or Danish differs as follows:

Basic Sweet Dough—To define normal fermentation of basic sweet dough means that ¾ to one full rise is given the dough before makeup, proofing, and baking.

Roll-in (or Danish) Dough—Normal fermentation for roll-in dough is to give one full rise, punch down, and rest 15 to 20 minutes. Roll in 2 to 5 oz of shortening per 1 lb of dough. Let dough loosen and rest 45 minutes, makeup, and pan proof. This requires about 3 hours total fermentation time.

613–f(2)—Retarded Basic Sweet Dough—Retarded dough is yeast dough that is placed in refrigeration for a period of time prior to baking. Refrigeration temperatures retard the fermentation process. The quality of the product is not lowered, however. The key factor in control of retarded sweet dough fermentation is temperature. The warmer the ingredients and the higher the mixing temperature, the faster the fermentation will take place. The ideal refrigerator temperature for holding is 35° F. Temperature must be kept below 40° F, if doughs are

to be held as long as 24 hours. Temperatures above 40° F will shorten the holding time correspondingly. If it is impossible to maintain temperatures this evenly, the process is not recommended. If possible, control humidity as well. An 85 percent relative humidity is recommended.

Savings in production time on sweet doughs can amount to as much as 66 percent of a baker's time when the retarded method is used in place of the normal fermentation.

The number of mixings of frequent, small batches can be reduced, for the preparation of larger scale sweet-roll production is made possible. The Navy activities that have used the method find that being able to mix dough during a slack work period is a major advantage.

The fermentation of regular sweet doughs can be retarded by one of the following methods:

Method A—Give the dough about ½ of its normal fermentation. Divide the dough into pieces desired for various shape products to be made up. Cover with wax paper and refrigerate immediately. After removal from the refrigerator, make up into units, pan, proof, and bake. This method permits more flexible roll shaping.

Method B—Give the dough about ½ of its normal fermentation. Then make up the dough in desired roll shapes, pan, and immediately refrigerate. Do not proof after panning, but give the made-up units normal pan proofing after removing from the refrigerator. The storage of made-up units may save and make better use of the baker's time. Another advantage is that the rolls can be baked off by someone other than the baker. Made-up units store safely about 60 hours if held at 32° F, and they may be finished just in time to supply hot buns for the serving line.

Method C—Divide the dough into four equal pieces of approximately 6¼ lb each. Place two flattened, lightly greased pieces in each greased baking pan, and refrigerate until needed at 32° to 40° F. When needed, the dough may be removed and made up into rolls without first being brought to room temperature. Proof the rolls in the usual way.

613-f(3)—Retarded Roll-In Doughs—For retarded roll-in dough, give dough ¾ normal fermentation. Roll in 2 to 5 oz of shortening per 1 lb of dough, make up, and refrigerate.

The proper temperature of the dough for roll-in dough is important. The temperature of the dough should be cold enough to keep the roll-in fat firm. Cool doughs will roll out with less effort. The temperature of the dough should be about 65° F. Dough should be kept cool during the rest periods between each rolling and folding.

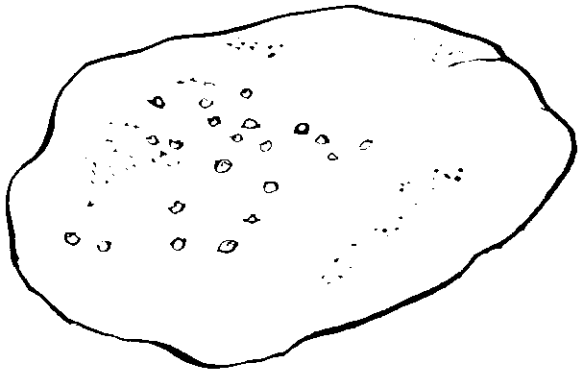
In handling retarded roll-in or Danish dough, it is more usual to make up 4- to 5-lb pieces and refrigerate. Under proper conditions this dough will keep for 72 hours or more. The piece should be brought to room temperature before makeup.

Roll-In (or Danish) Dough Process (Normal Fermentation)—Butter or shortening may be used in roll-in doughs. The roll-in product and the dough should have the same degree of plasticity; the reason for this is that when the pieces are folded and sheeted the layers of fat and dough will not be forced through each other because of one being firmer than the other. Do not use excessive dusting flour before folding.

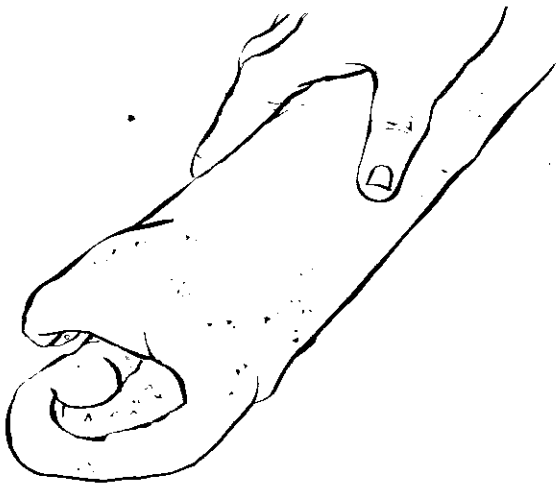
A practical way to make up roll-in dough is outlined herein:

Step 1—As soon as dough is mixed, scale off 4- to 5-lb pieces. Roll out in oblong shape approximately ½ in thick. The roll-in fat

should be cold and the dough should be cool enough so that the fat will not melt. Dot the fat on the dough over ⅔ of surface.



Step 2—Fold end over portion not dotted. Bring other end over on top; this makes two layers of fat and three layers of dough.



Step 3—Turn lengthwise and repeat (but do not add any additional fat). Allow to rest in icebox 15 to 20 minutes before rolling and folding for second and third time. (Alternate method: At end of second roll, dough may be refrigerated for a 15-minute rest period to adjust dough temperatures before third roll.) Place on bench, cover with damp cloth until ready for makeup. Make up into desired units, as shown in the following illustrations. Wash if desired. Pan proof and bake.

Proofing Roll-In (or Danish) Dough—The proof box temperature should not be warm as this would melt the fat between the layers, allowing the roll-in fat to soak through the layers. The proofing temperature should be below the melting point of the fat. Underproofed doughs will not be flaky, overproofing will cause the roll-in fat to leak out. The oven or baking temperature should not be too low. The product should be baked quickly so that little time is allowed for the fat to leak from the layers of dough.

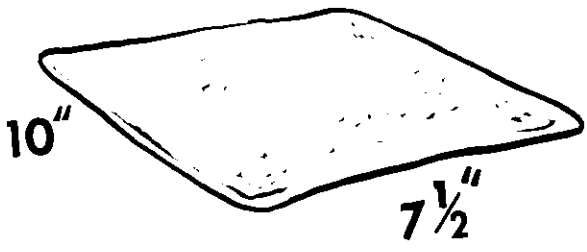
613-g—Sweet Dough Make-Up—The general procedure of make-up of regular sweet dough products differs from roll-in (or Danish) in that the dough must not be rolled in prior to the make-up. The baker may produce a variety of products from either type of dough, using the same procedure. The following steps apply:

Step 1—by using a variety of shapes,
Step 2—by using different fillings in make-up,
Step 3—by varying the finish or glaze of the baked product.

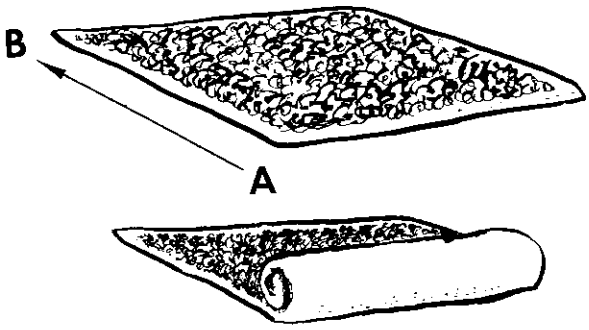
The shape of the finished "dough piece" on or in the pan will be nearly enough the same shape upon removal from the oven. Extreme carefulness in make-up is highly essential for the production of finished eye-appealing products. For a detailed description of a variety of possibilities for sweet dough making, see the following Illustrations.

Vienna Coffeecake

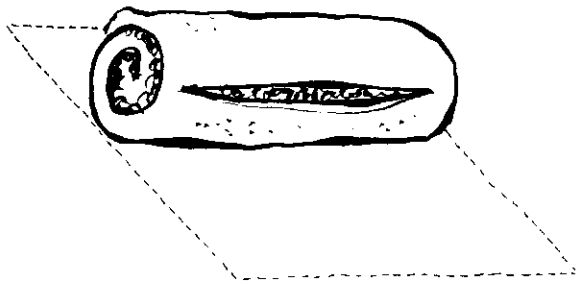
Step 1—"Roll out" an oblong piece of dough:



Step 2—Spread fruit filling over the entire surface and roll up starting at A and finishing at B. Seal the ends of the roll.



Step 3—Keep the seal on bottom; cut through center to leave ¾ in on each end.



Step 4—Place on pan with cut side up and spread out to expose filling. Place units carefully on flat sheet pans.

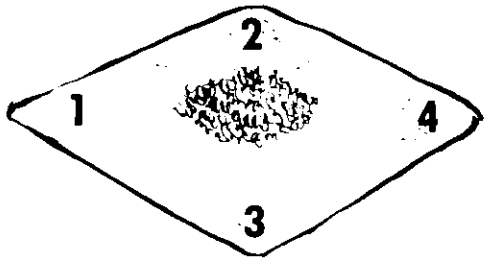
Step 5—Give ½ proof. Brush with egg-and-milk wash. Finish pan proofing. Bake immediately upon removal from the oven, wash with a desired glaze. When cool, "finish" in the desired manner, such as:

Ice with vanilla water icing; ice and sprinkle with chopped nuts (any variety of nuts); ice and top with streusel topping; ice and top with jam or jelly; ice and use diced fruits.

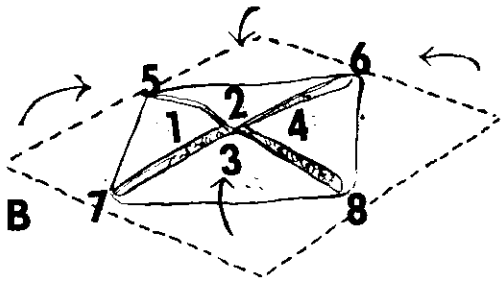
Finished product: Vienna Coffeecake:

Apricot Pineapple Square

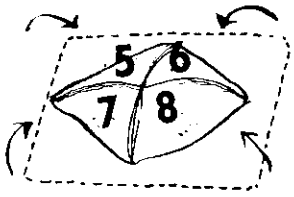
Step 1—Roll round piece of dough into a square, approximately 11 in x 1 in. Place apricot pineapple conserve in center.



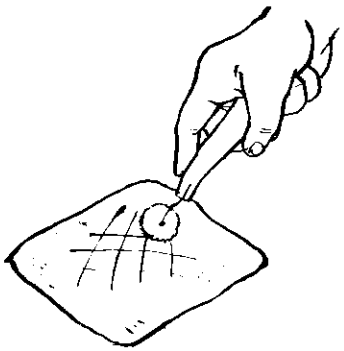
Step 2—Fold corners 1, 2, 3, 4 into the center, as in diagram B.



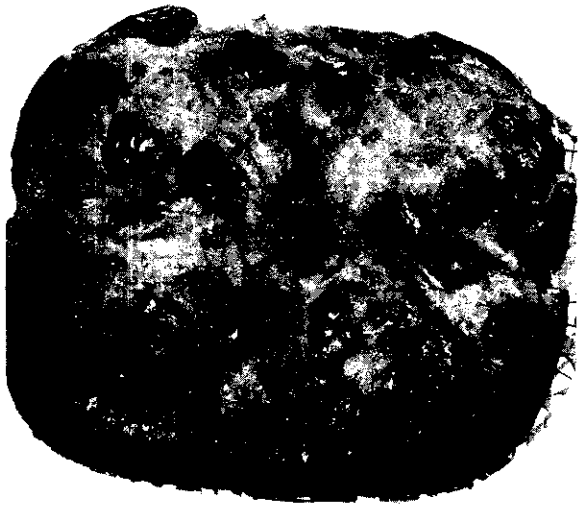
Step 3—Refold corners 5, 6, 7, 8 into center as in diagram C.



Step 4—Place folded side down on bench and flatten slightly into a uniform square shape. Take flattened piece and cut with pastry wheel, as indicated. Now place six units on a regular sheet pan.

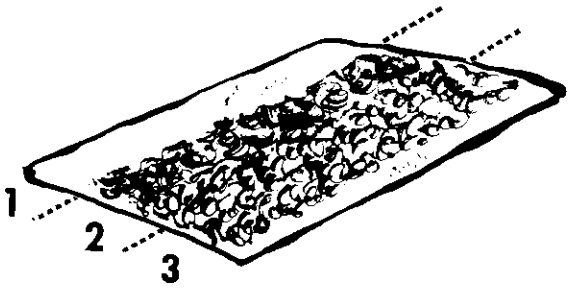


Step 5—Wash and pan glaze as shown for Vienna coffeecake. The finished product: Apricot Pineapple Square.

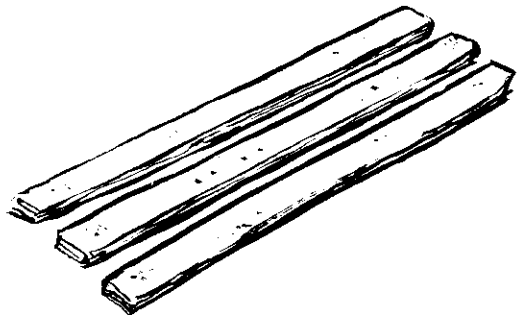


Cinnamon Filled Pretzel

Step 1—Roll out an oblong piece of dough into a rectangular shape approximately 14 in x 7 in. Spread melted butter and cinnamon sugar over ⅔ of the surface.



Step 2—Fold 1 over 2. After folding, brush top of 1 with egg-and-milk wash; when washed, fold 3 over 1 and 2. After folding, place sealed side down and flatten slightly into a uniform strip. Cut flattened piece into three strips as indicated.

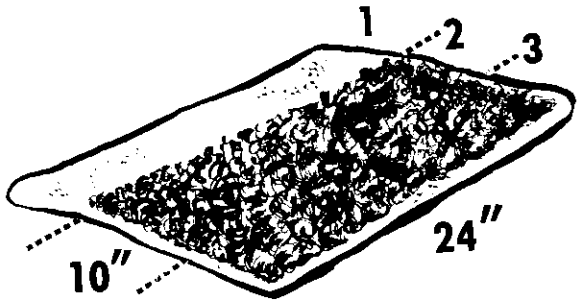


Step 3—Lengthen by stretching both ends; now twist the three pieces together by rolling ends in opposite directions and finish by making into pretzel shape, as shown:

Step 4—Wash, pan proof, and glaze as shown for Vienna coffeecake. The finished product: Cinnamon Filled Pretzel.

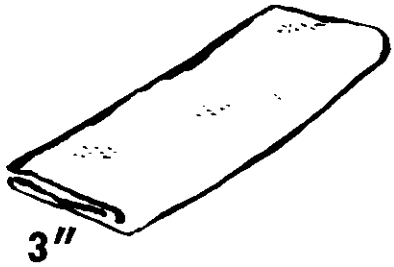
3-Braid

Step 1—Roll out an oblong piece of dough into rectangular shape, approximately 10 in x 24 in. Spread desired filling over ⅔ of the surface.

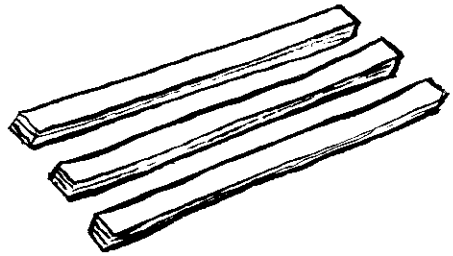


Step 2—Fold 1 over 2. After folding, brush top of 1 with egg-and-milk wash. When washed, fold 3 over 1 and 2.

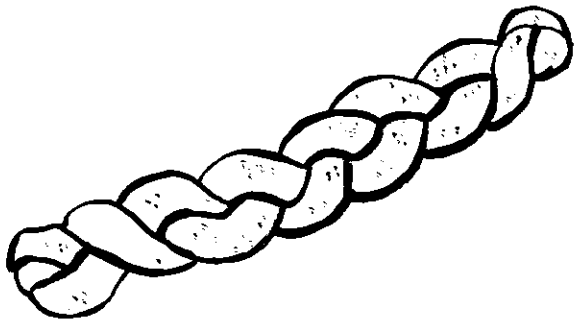
Step 3—Place sealed side down and flatten slightly into a uniform strip approximately 3 in wide and 24 in long.



Step 4—Cut flattened piece into three strips 1 in wide, as indicated in diagram.



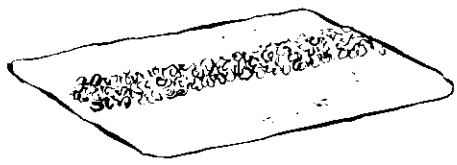
Step 5—Press three strips together at one end, and fold into a braid as shown.



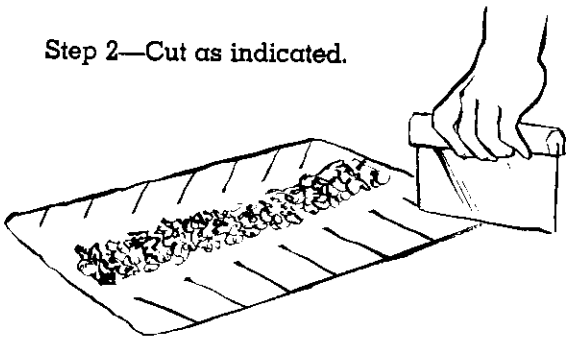
Step 6—Wash, pan proof, and glaze as shown for Vienna coffeecake. The finished product: 3-Braid.

Fruit Filled (Interlaced)

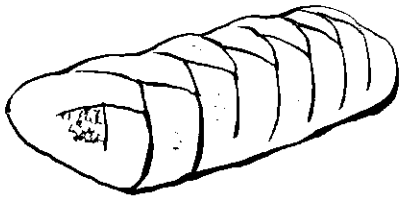
Step 1—Roll out an oblong piece of dough to a rectangular shape, approximately 8 in x 2 in. Spread fruit filling through center as shown.



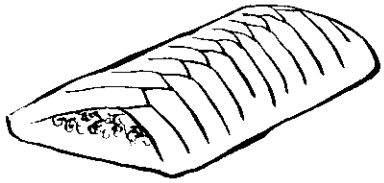
Step 2—Cut as indicated.



Step 3—Fold cuts to center, interlacing cut ends as shown.



Step 4—When finished lacing, place on pan and flatten slightly.

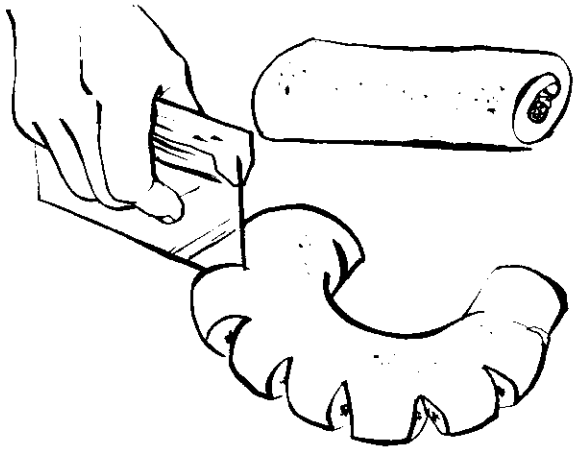


Step 5—Wash, pan proof, and glaze as shown for Vienna coffeecake. The finished product: Fruit Filled (Interlaced).

Horseshoe (Rooster Comb)

Step 1—Roll out an oblong piece of dough to rectangular shape, approximately 8½ in x 12 in. Spread poppyseed filling over ⅔ of the surface. Fold the edge without filling over ⅓ of the length as shown for 3-braids. Brush top with egg wash and seal. Place sealed side down and flatten slightly into a uniform strip. Place on sheet pan in a horseshoe shape.

Step 2—Cut as indicated in diagram.

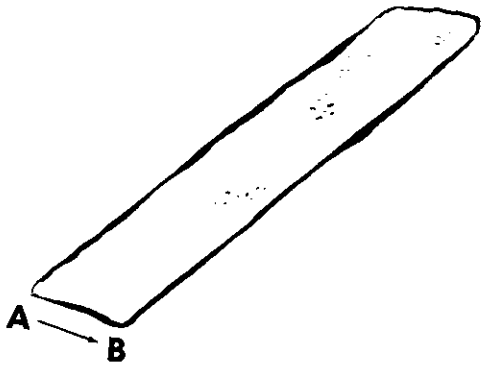


Step 3—Wash, pan proof, and glaze as shown for Vienna coffeecake. The finished product Horseshoe (Rooster Comb):

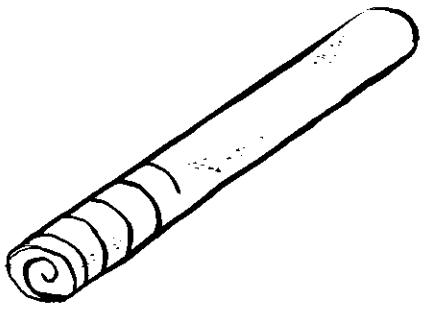
Cinnamon Bun

Step 1—Roll out a 3-lb piece of dough into a uniform sheet, approximately ⅛ in to $\frac{3}{16}$ in thick, 11 in to 12 in wide. Wash over with melted shortening, butter, water or egg wash.

Sprinkle on cinnamon-sugar mix and raisins or nuts, if desired Roll up, as shown in diagram, start at A, finish at B, and seal seam.

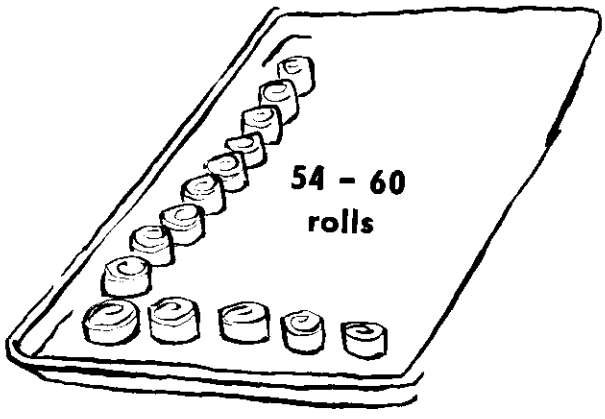


Step 2—Cut into desired weights (controlled by thickness).



NOTE: A 3-lb piece of dough generally yields 3 doz cinnamon buns.

Step 3—The buns are placed ½ in apart and baked on sheet pans, as shown.

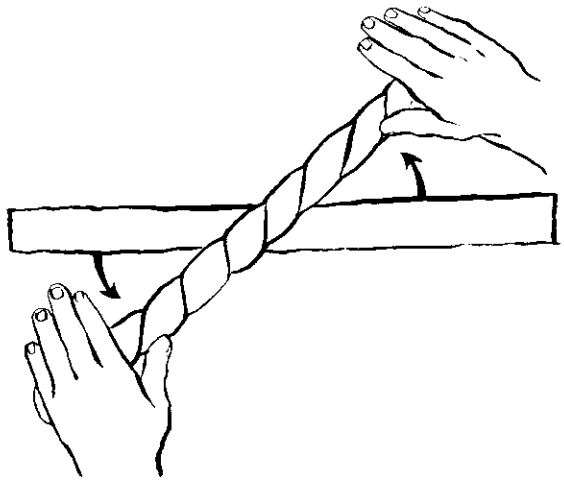


Step 4—Wash, pan proof, and glaze as shown for Vienna coffeecake.

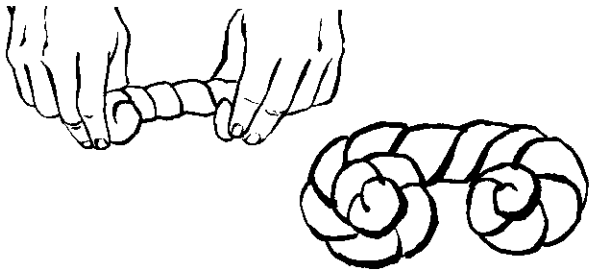
The finished product: Cinnamon Bun:

Danish Stroll (Any Fancy Shape)

Step 1—Take sealed strip and twist by rolling ends in opposite directions to bench (measurements are approximate).



Step 2—Without untwisting, curl into the following shape.

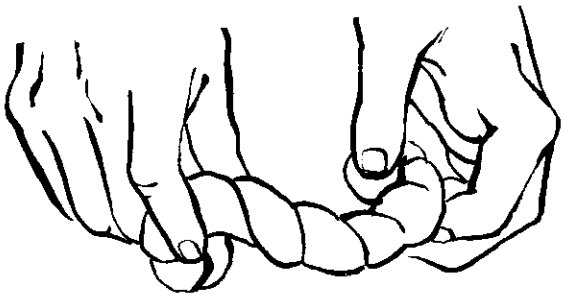


Step 3—Wash, pan proof, and glaze as shown for Vienna coffeecake. The finished product: Danish Stroll (Any Fancy Shape).

Double Snail

Step 1—Same as for Danish stroll.

Step 2—Curl as shown in diagram.

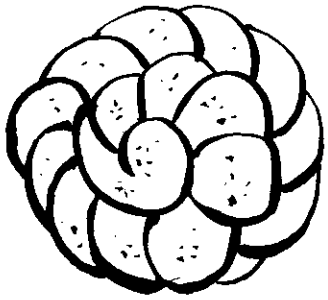


Step 3—Wash, pan proof, and glaze as shown for Vienna coffeecake. The finished product: Double Snail.

Schnecken (Snails)

Step 1—Same as for Danish stroll.

Step 2—Curl as shown in diagram. Place on pan.



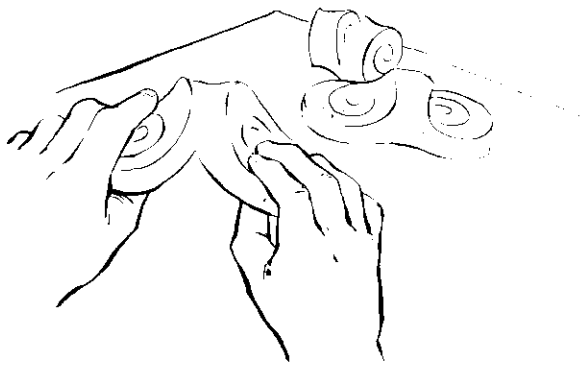
Step 3—Wash, pan proof, and glaze as shown for Vienna coffeecake. The finished product Schnecken (Snails):

Double-Leaf Rolls

Step 1—Same as for cinnamon buns, except that any filling can be used.

Step 2—Cut pieces with scraper to about ½ in from bottom; spread, as shown. Place on

pan cut side down.

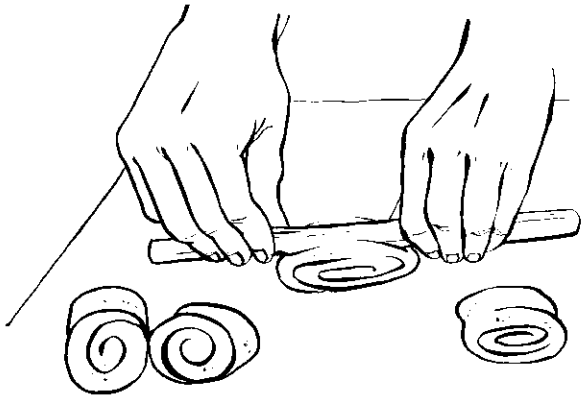


Step 3—Wash, pan proof, and glaze as shown for Vienna coffeecake. The finished product: Double-Leaf Rolls.

Butterfly Rolls

Step 1—Same as for cinnamon buns, except that any type of filling can be used.

Step 2—Press a small pin across the center of each roll, as shown.

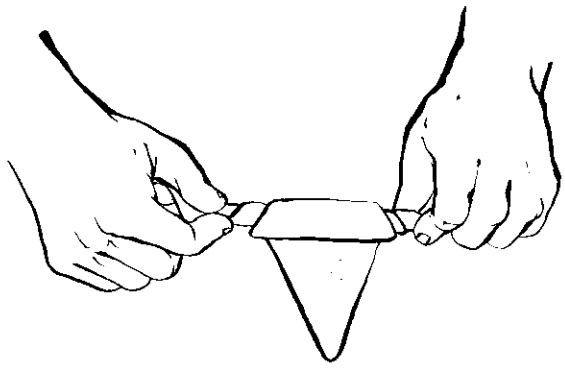


Step 3—Wash, pan proof, and glaze as shown for Vienna coffeecake. The finished product Butterfly Rolls:

Pointed Crescents

Step 1—Roll out a 1½-lb piece of dough into an 18-in circle, ⅛ in to ¼ in thick. Cut into triangular shapes. Brush with melted butter.

Step 2—Beginning at wide end, roll up each piece as shown, bringing point just under roll and press firmly in place.



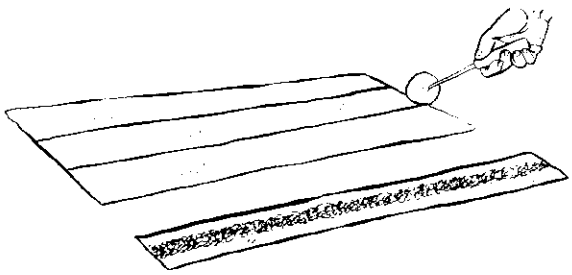
Step 3—Place 1½ in apart on greased baking sheets. Bring ends toward each other to form crescent shape.

Step 4—Wash, pan proof, and glaze as shown for Vienna coffeecake.

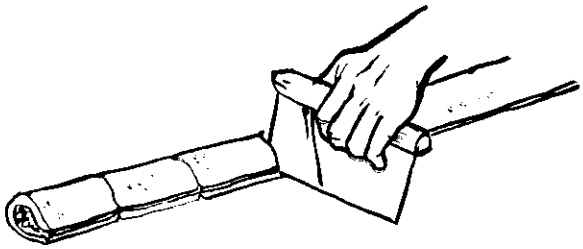
The finished product: Pointed Crescents:

Rooster Combs

Step 1—Roll out pieces of dough 12 in wide, 48 in long, and ¼ in thick. Cut the rolled-out piece into three strips, 4 in wide. Pipe filling in center of each strip, as shown.



Step 2—Fold dough, bringing edges together. With scraper, cut into 3 in lengths as shown.



Step 3—Bend into horseshoe shape, and cut into desired lengths.

Step 4—Wash with egg wash, sprinkle with chopped nuts, and arrange in pans, keeping the horseshoe shape. Give ⅔ proof and bake at 400° F. While still hot, brush with apricot glaze. The finished product: Rooster Combs:

Bear Claws

Step 1—Roll out a piece of dough ¼ in to ⅜ in thick, and 24 in wide. Cut the rolled piece into three strips, 4 in wide and pipe as shown for rooster combs.

Step 2—Make four cuts on open 3 in side as shown in diagram.

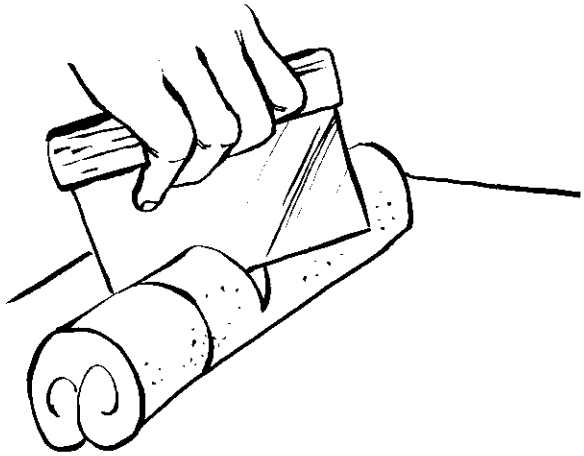
Step 3—Open slightly and place 1½ in apart on greased baking sheets. Wash with egg wash. Give ⅔ proof, and bake at 400° F. When baked brush with apricot glaze.

Step 4—Finished product: Bear Claws:

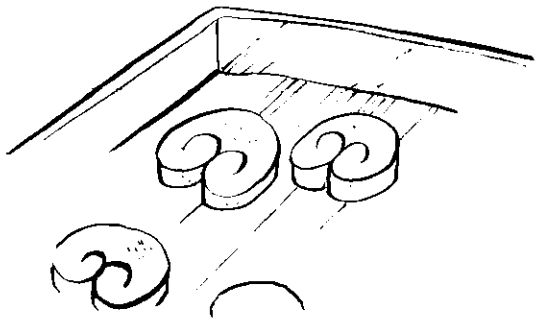
Streusel Rolls

Step 1—Roll out a 5-lb piece of dough into a uniform sheet 14 in wide and ½ thick. Brush the entire surface with egg wash and sprinkle with granulated sugar. Fold upper and lower edges toward the center and brush the top with egg wash. Fold again to make one roll.

Step 2—Cut into slices ½ in thick as shown.



Step 3—Place the slices (cut side down) on bench, brush with egg wash, and sprinkle heavily with streusel topping. Remove excess streusel and place on pans.



Step 4—Give ⅔ proof and bake at 400° F. Finish by stringing on vanilla water icing. The finished product: Streusel Rolls:

613-h—PAN PROOF OF SWEET DOUGH PRODUCTS—All sweet dough products require a full proofing period. Roll-in doughs should be proofed in a cool proof box. The baking temperature will vary depending on the size and shape of the items being baked. Sweet dough products should not be slow-baked. Almost any variety of roll may be topped with nuts or other topping before being baked; the rolls should be washed with an appropriate wash before topping and before proofing. All products should be glazed or iced while still warm. For a discussion of glazes and icing, see Section D, Part XVI, paragraph 1608, "Frostings, Fillings, Glazes, and Toppings."

614—YEAST-RAISED DOUGHNUTS

Doughnuts are produced in the Navy general mess in great quantities to meet the high demand for this popular item.

745-669 O - 65 - 13

Three types of dough formulas are used in making these doughnuts: (1) Cake batter; (2) yeast-raised sweet doughs; and (3) commercially prepared cake doughnut mix procured for the military services.

Doughnuts made from cake batter are chemically leavened; that is, made from a sweetened dough in which baking powder or a combination of soda and an acid ingredient is used. Doughnuts of this type are discussed in Section D, Part VII, paragraph 705–b(2), "Quick Breads." Many bakers prefer to make doughnuts from a commercially prepared mix, procured as a special bakery mix for the armed forces. These mixes are chemically leavened products and are also discussed under "Quick Breads."

Yeast-raised doughnuts are made from a rich sweet dough in which yeast is used for leavening.

Yeast-raised doughnuts are made by an appropriate formula. The dough is mixed and fermented, rolled out, cut by hand or machine into desired shapes, proofed to the proper size, and fried in deep fat.

614–a—FORMULA AND INGREDIENT FUNCTION—Basically, the doughnut formula is a sweet dough, but to make doughnuts, the formula is varied somewhat. Major changes are: (1) leavening, eggs are decreased and baking powder, seldom an ingredient in yeast-raised products, is added; (2) whole dry milk or nonfat dry milk is used; and (3) the shortening is increased. Doughnuts to be cut and dispensed from an automatic machine require still a different formula containing more liquid. Normally, cake doughnut formulas are used for this purpose.

The following variations are formulas for yeast-raised doughnuts:

Ingredient	Yeast-Raised Doughnuts NMCRS Based on Percent Flour[1]	Formula Using All Hard Wheat Flour Based on Percent Flour[2]	Lean Formula Based on Percent Flour[3]
Flour, hard wheat	62.50	100.00	67.00
Flour, soft wheat	37.50	.....	33.00
Water (approx)	43.75	57.14	44.00
Yeast	2.75	5.43	5.60
Salt	1.63	1.71	1.39
Sugar	14.13	10.86	11.11
Shortening	21.88	10.86	11.11
Eggs	15.25	7.14	11.11
Milk, dry nonfat	.....	12.00	4.17
Milk, other (whole, dry)	6.25	7.14	.....
Other:			
Baking powder	1.63	.....	.....
Vanilla	.13	.....	.....
Orange	.13	.....	.....
Nutmeg	.13	.....	.....
Mace	.13	.....	.....

[1] Fermentation time—1¼ hours.
[2] Fermentation time—1¾ hours.
[3] Fermentation time—1½ hours.

As noted in the formulas above, the type of flours used vary. Flours may be either a straight hard wheat flour or a blend with soft wheat flour in varying proportions. The blend of soft and hard wheat flour yields a product of more tender texture than 100 percent hard wheat flour used alone. As shown in the lean formula, as much as 50 percent soft wheat may be used, or other combinations are possible.

Doughnut formulas contain different percentages of sugar, shortening, and eggs; the higher the amount used the richer the dough, but the variations in richness for yeast-raised doughnuts do not extend over as wide a possible range as with cake doughnut formulas which tolerate larger quantities of sugar and eggs.

Formulas containing all hard wheat flour have more yeast and require longer fermentation than when flour blends and less yeast are used. Fermentation time is shortened when chemical leavens are included in the formula because it gives additional life to the yeast action.

The sugar content in yeast-raised doughnuts controls the amount of browning and fat absorption during the frying to a certain extent.

Potatoes are used as a doughnut ingredient in some formulas. This may be included as potato water or as mashed potatoes. Potatoes not only extend keeping quality to yeast-raised products like doughnuts, but enhance the flavor as well. The potato aids dough fermentation because in the cooked state, its starch is broken down into a form readily usable by the yeast; that is, the potato starch is "gelatinized."

Potatoes are substituted for part of the liquid. On a volume basis, the substitution is about 1 pt of potatoes for 1 pt of water.

The quality of ingredients is just as important in doughnut production as in other yeast-raised items. Extreme care in mixing, fermentation, and makeup is essential to high-quality doughnut production.

614–b—MIXING—Mixing temperature should be controlled so that it leaves the mixer at 90° F. The temperature of the ingredients when mixed has a decided effect upon the amount of fat absorbed during frying. Mixing time should be limited to 7 minutes. The dough should be medium soft. For information on how to adjust or compensate for ingredient temperatures see paragraph 606, "Temperatures Involved in Making Yeast-Leavened Products," and for information on mixing sweet doughs see paragraph 613. Dough temperatures of 90° F are more desirable than room temperature (72° F). Doughs mixed at 72° F absorb more fat during frying.

614–c—FERMENTATION AND MAKEUP—Mixed doughs should be taken to the bench at once and divided into uniform pieces, size depending upon the weight of the entire batch being made up. If 32 lb is the batch weight, divide into four 8-lb pieces. Allow the dough to rest for about ½ hour. One lb of dough will yield about 1 doz doughnuts. Follow recipe instructions for rolling and cutting, as thickness of dough and uniformity of doughnut size is extremely important to proper frying. If there are cracks in the dough, or if the dough is stretched unnecessarily, this will tend to make the dough absorb a greater amount of fat during frying.

Cutting—Doughnut cutters should be carefully used so as to preclude overlapping of cuts and the wasting of dough. Reworked and rerolled doughs do not give cut doughnuts a smooth surface and greatly influence the frying time and evenness of brown color.

Doughnuts may be cut into various shapes. Other than the characteristic round shape without centers, there are Long Johns, Bismarks or jelly doughnuts, and crullers or twists.

Yeast-raised doughnuts are not dispensed from a machine into frying fat or mechanically cut because they require a short proofing period. This is a necessary part of the fermentation process. Cake doughnut batters are used for automatic doughnut production. (See Section D, Part VIII, "Quick Breads," par. 705–b(2).)

614–d—FRYING—For frying doughnuts heat fat to 375° F. Make certain temperature is correct for doughnuts will soak up fat that is too cool, and will brown before they are done if too hot. Place cut doughnuts carefully in fry baskets ½ in apart and lower into hot fat. Avoid crowding; allow for expansion of dough and turning room.

If proper formula is used, doughnuts will not soak grease in the frying process. Normal fat absorption should be 2 to 3 oz per dozen doughnuts. This absorption is both desirable and necessary to high-quality products. Grease soaking is undesirable, however, and is caused principally by undermixing of dough, misshapen cuts and rough surfaces, and poor-quality fat used in the frying process. A fat-soaked doughnut is heavy, greasy tasting, and stales very rapidly.

Doughnuts removed from the fat should be thoroughly drained on brown paper and cooled to 160° F if glazed; or if finished off with coatings, doughnuts should be cooled to room temperature (72° F). (See par. 614–e.)

614–e—GLAZES AND COATINGS FOR DOUGHNUTS—Most everyone prefers a coating or finish of one type or another on doughnuts, although some are left plain for those not desiring the extra sweetness.

There are endless combinations of ingredients that can be used for this purpose. The following are the more commonly used combinations:

Dry Coatings.....	Cinnamon-sugar mixture.
	Powdered sugar (with cornstarch added as stabilizer).
	Plain granulated sugar.
	Powdered sugar-shortening-milk (nonfat) solids.
Glazes:	
Vanilla water icings.	Variations include vanilla, chocolate, orange, crunch.
Cream icings..	Crumbs, nuts, or coconut added.
Plain cold glaze.	(Made 4 lb powdered sugar and 12 oz water mixed.)
Cooked glazes.	

Fillings may be used also in doughnuts. Jelly, custard, or fruit are commonly used in Long Johns and Bismarks, applied by a cream-puff filler.

The dry coatings are used most often on cake doughnuts and glazes usually are applied to the yeast-raised type.

The application of dry sugar coatings is somewhat more complicated than the mere shaking together of a properly cooled fried cake and sugar in a paper bag. In large-scale bakery operations, special sugar-feeding machines are used for this purpose. In most average-sized feeding operations, sugar mixtures are placed in a bowl or a revolving drum, the doughnuts are placed in the mixture, and stirred.

Many factors influence the degree of success with doughnut sugaring. Problems in making the sugar adhere are found in both large- and small-scale bakeries. An overcooked doughnut does not take well to sugaring. The sugar sheds off rapidly. This condition is due to an excessive loss of moisture from the dough in frying. On the other hand, a sugared doughnut appearing moist on the surface may be an undercooked doughnut. As soon as the sugar is added, the excess water moves out of the

doughnut toward the sugar. If the sugar melts or disappears, the doughnut is too moist. This condition is known in the baking trade as "sweating."

In other words, the problems attendant to sugaring are lessened if the doughnut is in the right condition for it. If not, corrective measures must be applied to the doughnut production itself.

One of the most common reasons for under- or over-cooking is too much moisture in the formula. Running test batches with water adjusted will help determine whether this is the cause. Another common fault is the fat used for frying. A change in fat in the fryer may be the answer. Fat soakage in the doughnut results in the sugar being greasy feeling and tasting. Doughnuts to be sugared must be first cooled in room temperature. This is essential to reducing the "sweating" problem of doughnuts.

Doughnut glazing is somewhat more complicated than the sugaring process. In comparison, the glaze is much less stable, particularly if subjected to warm temperatures. Obtaining the right consistency of glazes constitutes the major problem in their application. Glazes should be sufficiently thin to flow and to allow the excess to roll off. A glaze of this consistency is less stable than a more viscous glaze and is more difficult to handle.

Temperature control of the doughnut and the glaze is important to handling. Doughnuts must not be less than 160° F at the time of glazing. Coming from a 375° F fat, a doughnut will cool to this temperature in about 1 to 2 minutes. Doughnuts should be submerged into the glaze and drained on a wire screen until the glaze is set. Air circulation around the entire doughnut is important to setting the glazes.

615—PIZZA

Almost any lean dough formula, such as that for French bread, can be used for making pizza, an alltime favorite in the general mess. The major difference between a particular formula for pizza and lean-bread doughs is that the yeast is not fed; that is, sugar is not an ingredient in a pizza formula because it is not needed to supply the yeast energy. Volume is not a factor in pizza doughs. Fermentation for pizza is relatively short in comparison with other bread doughs, and makeup consists only of flattening dough to the required dimensions.

Pizza may be produced by a quick-bread formula as well, although this type dough is less typical of this Italian dish.

GLOSSARY OF BAKING TERMS

Absorption..... The property of flour to absorb and hold liquid.

Acidity..... Sourness or tartness in a food product; a condition indicating excess fermentation in yeast doughs. Also, a factor used with soda to generate carbon dioxide for cake leavening.

Aeration..... The treatment of dough or batter by charging with gas to produce a volume increase.

Albumen..... Egg white.

Batter..... A homogeneous mixture of ingredients with liquid to make a mass that is of a soft plastic character.

Bench tolerance.. The property of dough to ferment at a rate slow enough to prevent over-fermentation while dough is being made up into units on the bench.

Bleached flour... The term refers to flour that has been treated by a chemical to remove its natural color and make it white.

Bleeding..... Term applied to dough that has been cut and left unsealed at the cut, thus permitting the escape of leavening gas. This term also applies to icing that bleeds.

Bolting..... Sifting of ground grain to remove the bran and coarse particles.

Bowl knife..... A spatula or flexible dull-edge knife used to scrape batter or dough from bowl sides.

Bran..... Skin or outer covering of the wheat berry.

Butterhorns.... Basic sweet dough cut and shaped like horns.

Butter sponge. Cake made from sponge-cake batter to which shortening has been added.

Butterscotch.... A flavor produced by the use of butter and brown sugar.

Caramelized sugar. Dry sugar heated with constant stirring until malted and dark in color, used for flavoring and coloring.

Carbohydrates... Sugars and starches derived chiefly from fruits and vegetable sources which contain set amounts of carbon, hydrogen, and oxygen.

Carbon dioxide.. A colorless, tasteless edible gas obtained during fermentation or from a combination of soda and acid.

Cardamon..... Seed of an East Indian spice plant used for flavoring.

Clear flour..... Lower grade and higher ash content flour remaining after the patent flour has been separated.

Compounds..... In the baking industry, certain mixtures of fats and oils.

Congealing point. Temperature at which a liquid changes to a plastic or a solid.

Creaming..... The process of mixing and aerating shortening and another solid, such as sugar or flour.

Creampuffs..... Baked puffs of creampuff dough which are hollow; usually filled with whipped cream or cooked custard.

Crescent rolls.... Hard-crusted rolls shaped into crescents, often with seeds on top.

Cripple..... A misshapen, burnt, or otherwise undesirable unit.

Crullers..... Long, twisted, baking powder doughnuts.

Crusting..... Formation of dry crust on surface of doughs due to evaporation of water from the surface.

Currant..... The acidulous berry of a shrub; usually dried.

Danish pastry.... A flaky yeast dough having butter or shortening rolled into it.

Diastase..... An enzyme possessing the power to convert starches into dextrose and maltose.

Divider..... A machine used to cut dough into a desired size or weight.

Docking..... Punching a number of vertical impressions in a dough with a smooth round stick about the size of a pencil, or smaller. Docking is done so that doughs expand uniformly without bursting during baking.

Dough..... The thickened uncooked mass of combined ingredients for bread, rolls, and cookies, but usually applied to bread.

Dough conditioner. A chemical product added to alter flour in its properties to hold gas.

Dough room..... Special room in which bread doughs are mixed.

Dough temperatures. Temperature of dough at different stages of processing.

Dry yeast..... A dehydrated form of yeast.

Dusting..... Distributing of film of flour or starch on pans or workbench surfaces.

Dusting flour.... Flour used to sift onto dough-handling equipment to prevent dough from sticking.

Eclair..... A long thin shell of the same paste as creampuffs.

Emulsification... The process of blending together fat and water solutions of ingredients to produce a stable mixture which will not separate on standing.

Enriched bread.. Bread made from enriched flour and containing federally prescribed amounts of thiamin, riboflavin, iron, and niacin.

Enzyme..... A substance produced by living organisms which has the power to bring about changes in organic materials.

Extract..... Essence of fruits or spices used for flavoring.

Fat absorption... Fat which is absorbed in food products as they are fried in deep fat.

Fermentation.... The chemical changes of an organic compound due to action of living organisms (yeast or bacteria), usually producing a leavening gas.

Finger rolls..... A bun about 5 in. long and 1 in. wide.

Flour extraction.. A term referring to the proportion of the wheat that becomes flour. Commercial flours in the United States are 72 percent extraction.

Fluff..... A mass of beaten egg white, air, and crushed fruit.

Foam..... Mass of beaten egg and sugar, as in a spongecake before the four is added.

Fold..... To lap yeast dough over onto itself. With cake batter to lift and lap the batter onto itself to lightly incorporate ingredients.

Fondant..... Low moisture content sugar sirup containing a small quantity of invert sirup which has been rapidly cooled so that the sugar crystals are small in size.

Formula..... In baking a recipe giving ingredients, amounts to be used, and the method of preparing the finished product.

French bread.... An unsweetened crusty bread, baked in a narrow strip and containing little or no shortening.

French knife.... A long knife with a pointed blade used in cutting cakes, doughs, and nuts.

Germ..... That part of the seed from which the new plant grows.

Glace..... Sugar so treated as to resemble ice.

Gliadin..... One of the two proteins comprising gluten, which provides elasticity.

Glucose (corn sugar). A simple sugar made by action of acid on starch.

Gluten..... The elastic protein mass that is formed when the protein material of the wheat flour is mixed with water.

Glutenin..... One of two proteins comprising gluten, which gives it strength.

Graham flour.... Finely ground whole wheat flour.

Graining..... After boiling a sugar solution to the desired temperature the solution will crystallize upon cooling. If cooling is slow, large crystals will form. Rapid cooling produces small crystals as will rapid mixing during cooling. Small fine crystals are desired in making fondant and this is accomplished by cooling and mixing. This process is called graining.

Hearth..... The heated baking surface of the floor of an oven.

Honey..... A sweet sirupy substance produced by bees from flower nectar.

Horseshoes..... Danish or puff pastry shaped like horseshoes.

Hot cross buns... Sweet, spicy, fruity buns with cross cut on top which usually is filled with a plain frosting.

Humidity..... Usually expressed as relative humidity, which is an expression of percent of moisture in air related to the total moisture capacity of that air at a particular temperature.

Hydrogenated oil. A natural oil that has been treated with hydrogen to convert it to a hardened form.

Invert sugar..... A mixture of dextrose and levulose made by inverting sucrose with acid or enzymes.

Jellywreath..... A rolled ring of basic sweet dough containing jelly.

Lactose..... The sugar of milk.

Leavening..... Raising or lightening by air, steam, or gas (carbon dioxide). Usually, the agent for generating gas in a dough or batter is yeast or baking powder.

Levulose..... A simple sugar found in honey, fruits, and invert sugar.

Makeup..... Manual or mechanical manipulation of dough to provide a desired size and shape.

Malt extract..... A sirupy liquid obtained from malt mash; a product obtained as a result of converting the starch to sugar.

Marble cake..... A cake of two or three colored batters partially mixed.

Marzipan..... Almond paste used for modeling, masking, and torten.

Masking..... Act of covering with icing or frosting.

Melting point.... The temperature at which a solid becomes a liquid.

Meringue..... A white frothy mass of beaten egg whites and sugar.

Middlings..... Granular particles of the endosperm of wheat made during grinding of the grain in the mills.

Mocha..... A flavor combination of coffee and chocolate, but predominately that of coffee.

Molder..... Machine that shapes dough pieces for various shapes.

Old doughs..... Yeast dough which has become overfermented due to long fermentation. This produces a finished baked loaf dark in crumb color, sour in flavor, low in volume, coarse in grain, and tough in texture.

Parkerhouse rolls Folded buns of fairly rich dough.

Patent flour..... The clean flour made by grinding the choice portion of the inner portion of wheat.

Plasticity..... The consistency or feel of shortening.

Proof box..... A tightly closed box or cabinet equipped with shelves to permit the introduction of heat and steam; used for fermenting dough.

Proofing period.. The time during which dough rises between molding and baking.

Puff paste..... A pastry dough interlayered with butter or shortening to attain flakiness. Leavened during baking by the internally generated steam.

Quick breads..... Bread products baked from a lean chemically leavened batter.

Rocks..... Small rough-surfaced fruited cookies made from a stiff batter.

Rope..... A spoiling bacterial growth in bread experienced when the dough becomes infected with bacterial spores. Poor sanitation can result in rope in breads.

Rounding or rounding-up. Shaping of dough pieces into a ball to seal end and prevent bleeding and escape of gas.

Royal icing..... Decorative frosting of cooked sugar and egg whites.

Saturation..... Absorption to the limit of the capacity.

Scale..... An instrument for weighing.

Scaling..... Apportioning batter or dough according to unit of weight.

Scoring..... Judging finished goods according to points of perfection; or to cut or slash the top surface of dough pieces.

Sifting..... Passing through fine sieve for effective blending and to remove foreign or oversize particles.

Slack dough..... This is a dough that is soft and extensible but has lost its resiliency.

Snaps..... Small cookies that run flat during baking and become crisp on cooling.

Solidifying point. Temperature at which a fluid changes to a solid.

Stabilizers..... Commercial preparations sold for use in meringue pie fillings, icings, and marshmallows. (If used, follow package directions.)

Starch water..... A mixture of cornstarch and water made by boiling together 1 or 2 tbsp of cornstarch with 1 qt of water. This is used for brushing on bread to give a shine to the crust.

Straight flour.... Flour containing all the wheatberry except the bran and feeds; termed 100 percent.

Strong flour..... One which is suitable for the production of bread of good volume and quality.

Sugar:

Cane or beet (sucrose). Common and usually granulated sweetening agent.

Corn (dextrose). A form of sugar made from corn and readily fermentable.

Maltose..... A form of sugar obtained by germinating cereal grain. Usually supplied as a sirup.

Tarts..... Small pastries with heavy fruit filling or cream.

Tempering..... Adjusting temperature of ingredients to a certain degree.

Texture..... Describes the measure of silkiness of the interior structure of a baked product as sensed by the touch of the cut surface.

Troughs..... Large containers usually on wheels used for holding large masses of raising dough.

Vienna bread.... A hearth-type bread with heavy crisp crust, sometimes finished with seed topping.

Wash..... A liquid brushed on the surface of an unbaked or baked product (may be water, milk, starch solution, thin sirup, or egg).

Water absorption. Water required to produce a bread dough of desired consistency. Flours vary in ability to absorb water. This depends on the age of the flour, moisture content, wheat from which it is milled, storage conditions, and milling process.

Whip..... A hand or mechanical beater of wire construction used to whip materials such as cream or egg whites to a frothy consistency.

Yeast..... A microscopic plant which reproduces by budding and causes fermentation and the giving off of carbon dioxide.

Young doughs... Yeast dough which is under-fermented. This produces finished yeast goods which are light in color, tight in grain, and low in volume (heavy).

Zwieback..... A toast made of bread or plain coffee cake dried in slow oven.

PART VII: QUICK BREADS

PART VII: QUICK BREADS

Simple Batters and Flour Mixtures

701—INTRODUCTION

Quick breads are so called because they are a baked product leavened by quick leavening agents. The time required to mix and bake them is fast, or comparatively short.

The leavening process is an action by which a dough or batter is expanded, or rises in volume. Any material which brings this about is called a leavening agent. As discussed in Part VI, "Yeast-Raised Doughs," this process may be caused by one of these actions: (1) Yeast fermentation; (2) air mixed into the batter, as when whipping eggs or in the creaming of shortening and sugar; and (3) incorporating chemicals which cause gas to form in a dough or batter. A certain amount of leavening also is done by steam.

A wide assortment of baked items are leavened by the second and third types of leavening, or a combination of the two. Included in this group are:

Biscuits, baking powder
Brown bread
Coffeecakes
Cornbread
Creampuffs (or eclairs)
Doughnuts, cake
Dumplings
Fritters
Gingerbread
Griddlecakes
Muffins
Scones or shortcake
Yorkshire pudding

In addition, fry or batter mixtures and coating materials are included in this category because of their similarity to quick breads.

Quick-raised breads are relatively inexpensive additions to the menu, and are extremely popular in the general mess.

Quality and quantity control of these products is important because of their rapid staling rate.

702—CLASSIFICATION OF QUICK BREAD BATTERS AND DOUGHS

Mixtures leavened by steam, incorporated air, or chemical leavening agents make up into different kinds of batters and doughs. Consistency of a batter or dough is the basis for the classification of them. The two major classifications are soft batters or roll-out doughs.

702-a—SOFT BATTERS—These contain varying amounts of liquid and may be subdivided into:

(1) Pour Batters—Those thin enough to pour directly from a container into cooking pans. An example of a pour-type batter is griddle cakes.

(2) Drop Batters—Those thick enough to require "spooning" into cooking containers. Muffins are an example of a drop batter.

702-b—ROLL-OUT DOUGHS—The flour mixtures referred to as doughs are:

(1) Soft dough, such as dumplings and baking powder biscuits.

(2) Stiff doughs, such as cake doughnuts and scones.

703—INGREDIENTS USED IN BREADS AND BATTERS

Batters or doughs are made with dry mixtures of flour; baking powder; salt; liquids; and other ingredients such as fats, eggs, sugar, and flavoring.

703–a—FLOUR—Types of flour used for quick breads and batters are:

Hard Wheat
- Biscuits
- Bread, brown
- Muffins
- Cake doughnut (automatically cut)
- Creampuffs or eclairs
- Fritters
- Fry or batter mix
- Griddlecakes
- Dumplings
- Scones
- Yorkshire pudding
- Cornbread

Soft Wheat
- Gingerbread
- Crumbcake (Snickerdoodle)

Combination of Hard and Soft Wheat
- Cake doughnuts (handcut)
- Quick coffeecake

The specific uses of hard versus soft wheat, or a combination of hard and soft wheat, in quick breads and batters depends upon the desired texture of the end product. Soft wheat, or a combination of soft and hard wheat flours, produce finer grained baked items than hard wheat flour used alone. Items listed under "hard wheat" do not have the "velvety" texture characteristic of crumb cake and gingerbread. Type of flour in these items is specified "hard wheat" because most of the formulas require a high ratio of liquid to flour. Hard wheat flour absorbs more liquid than soft wheat flour. A certain degree of dough development is required to furnish structure to products in this category.

703–b—LIQUIDS—These may be dry whole or nonfat milk, fresh whole, or evaporated milk.

703–c—LEAVENING AGENTS—These may be any harmless agent which makes a mixture expand. A number of agents and actions are involved in leavening quick breads and batters.

703–c(1)—Acid Substances Plus Baking Soda—These include:
- Sour milk or buttermilk plus soda
- Molasses plus soda
- Brown sugar, honey, corn sirup, or maple sirup plus soda

Sour milk or molasses plus soda generates gas for leavening purposes. These are used in most quick breads in combination with baking powder for fast leavening action. A limited quantity can be used for leavening purposes due to the pronounced flavor and heavy texture that soda and molasses give to products.

703–c(2)—Baking Powder—Baking powder is a leavening agent which contains baking soda, a large amount of starch, and a material which forms an acid when it is mixed with water thus producing a gas. It is required by law that baking powder produce not less than 12 percent carbon dioxide gas when mixed with liquid.

There are several types of baking powder. The chemical used to form the acid specifies its type. Baking powders of importance to the baker are:

SAS–Phosphate Type—There are two acid materials, sodium aluminum sulfate (SAS) and

monocalcium phosphate. This makes a "double acting" baking powder, meaning that one acid constituent acts on baking soda in the batter, while the other does not act until it is heated in the oven. This is the type purchased by the military services.

Pyrophosphate Type—The acid ingredient is sodium acid pyrophosphate. It is a slow-acting baking powder because this compound is only slightly soluble in water. A disadvantage is that a slight excess of the baking powder gives the baked product a bitter aftertaste.

Others—Other baking powders have different combinations of these acid ingredients; however, the action of all of them is similar. About ¼ less SAS powder is used than other types. The common ones are tartrate (cream of tartar plus tartaric acid, or a combination) or phosphate powders.

The amount of baking powder which must be used depends on the type of baked product, and on the kinds of proportion of ingredients, usually upon the amount of flour in a formula. Baking powder should be scaled accurately. Too much baking powder produces a coarse grain. The cell walls may be broken, causing the product to fall after leaving the oven. The color will be dark and yellowish, and the taste will be salty or bitter. If too little is used the structure of the product will be heavy and dense with low volume.

703-c(3)—Steam—Many products are leavened by steam to some degree. Cream puffs are one product leavened by air incorporated into beaten eggs and expanded by steam from the liquid at high oven temperatures.

703-d—FAT—Hydrogenated shortening is used in quick bread and batter production. Shortenings make a softer crumb quality and aid browning.

703-e—EGGS—An important ingredient to quick breads and batters is eggs which add flavor, color, and palatability. They also provide some leavening action.

Fresh whole eggs or frozen whole baking-type eggs are used. Dry whole eggs may be used as a successful substitute in any recipe where whipping properties are not important if the eggs are sifted with the dry ingredients to ensure even distribution and uniform reconstitution when the liquid is added.

703-f—OTHER INGREDIENTS—Sugar may be either white or brown. Honey or molasses is used in special breads such as brown bread. Sugar is used principally for flavor in quick breads, but it also aids browning.

Salt also aids flavor. Other miscellaneous ingredients include spices; grated, whole, or chopped fruits or nuts; seeds; or cereals such as bran or cornmeal.

704—MIXING METHODS

How a product is mixed determines to a large extent the structure and texture of the finished product. All ingredients must be evenly mixed. If needed, the flour gluten must be developed to the desired degree to keep the loss of the leavening gas to a minimum during baking.

704-a—GENERAL RECOMMENDATIONS FOR MIXING—These general rules of thumb apply to mixing quick breads and batters, whichever mixing method is chosen:

(1) The degree of mixing is always limited when the leavening is produced by baking powder and/or a soda-acid combination of ingredients.

(2) The amount of mixing varies with the kind and proportion of ingredients other than leaven-

745-669 O - 65 - 14

ing. For example, a product containing a high percentage of fat and sugar may be mixed longer with less harm to the quality of the finished product.

(3) To prevent lumping: For thin mixtures, add liquid ingredients to dry ingredients **gradually.** For thick mixtures, add liquid ingredients ALL AT ONCE.

704-b—THE MUFFIN MIXING METHOD—This method is used for these products:

Griddlecakes	Cornbread
Muffins	Dumplings
Brown bread	Fritters

The sequence of steps for the muffin method include:

Step 1. Sift dry ingredients together into mixing bowl: Flour, sugar, baking powder, salt, dried eggs (if used), and spices.

Step 2. Blend liquids, including fresh or frozen beaten eggs, water or milk, and vanilla (if used). If directed on recipe, melted shortening is combined with liquid ingredients. Liquid quantities vary according to the product being made.

Step 3. Liquid ingredients are blended with the dry ingredients. The amount of stirring done is dependent upon the product, but a minimum should be done. If melted shortening is not added in step 2, it is combined after liquid-dry ingredients are mixed. Muffin, cornbread, and dumpling batter should be mixed only until dry ingredients are moistened as shown in illustration 1.

704-c—THE BISCUIT OR PASTRY METHOD—This means of combining ingredients is used principally for scones and baking powder biscuits, although cornbread and muffins may be made successfully by it.

This dough contains a greater amount of flour than liquid and is of a consistency that can be kneaded.

Illustration 1
Example of Muffin, Cornbread, and Dumpling Batter

These are the steps used:

Step 1—Sift dry ingredients together. Blend flour and baking powder thoroughly to give an even distribution of the leavening agent in the dough. Two or three siftings may be required.

Step 2—Blend in shortening. A good quality product is obtained by hand or electric mixer by cutting in of shortening into dry ingredients.

Step 3—Add liquid and mix only enough to yield a homogeneous dough.

Step 4—If biscuits are the product being made, roll out on floured bench. If corn muffins are the product, scale batter into muffin tins.

Step 5—If biscuits are the product, cut into desired shape or brush with melted fat, reroll, and cut into desired shape.

704-d—THE CAKE METHOD—Several quick breads and batters are mixed by the cake method. Coffeecakes and cake doughnuts are mixed similarly to batter cakes. The conventional method includes these steps:

Step 1—Cream shortening and sugar.
Step 2—Add beaten eggs.
Step 3—Gradually add dry and liquid ingredients (other than eggs) alternately, beginning and ending with dry ingredients.

704-e—**MISCELLANEOUS MIXING METHODS**—There are a group of quick bread and batter products not mixed by the muffin, biscuit or pastry, or cake methods. These products are:

Cream puffs or eclairs
Golden doughnuts
Yorkshire pudding

Mixing methods are discussed under the separate headings for these products.

705—QUICK-BREAD PRODUCTION

Included under the discussion of the various quick breads are formulas; quality characteristics of the product; and principal points in the mixing, cooking, and serving of these products.

705-a—**SOFT BATTERS**—Pour batters (cornbread, gingerbread, and griddlecakes) and drop batters (muffins, cream puffs, dumplings, and fritters) are discussed in this category. Ingredient variations, mixing methods, production techniques, and menu uses of these items are discussed under separate paragraphs.

705-a(1)—**Brown Bread**—The Navy-Marine Corps Recipe Service recipe for this bread is a variation of an oldtime recipe for baked brown bread. Originally, this bread was made with equal parts of rye meal or flour, cornmeal, and wheat flour; and contained baking soda and molasses plus sour or buttermilk for leavening. The bread was steamed in round molds or cans with a tight-fitting cover. Alteration in the recipe was made to utilize standard items of issue and to extend its shelf life.

In place of rye meal or flour, bran flakes are used in the recipe for baking this bread for the Navy general mess. Raisins and brown sugar are also different ingredients. This bread is somewhat light in color and has a porous texture because baking powder is used in addition to the acid (molasses, brown sugar) plus soda combination.

The Muffin mixing method is used for brown bread. It requires a somewhat longer baking period than other quick breads because of the nature of the ingredients used and the loaf-type pan in which it is baked.

705-a(2)—**Coffee Cakes**—These products are popular breakfast or brunch items. The formulas are not different from regular cakes eaten for desserts at the dinner-supper meal except for minor ingredient changes. The major difference is in the frosting and/or icing used on cakes.

Breakfast cakes are either topped with sweetened crumbs or combined with fruit. Crumb cake or other quick coffee cake recipes in the Navy-Marine Corps Recipe Service, are of this type.

Usually, coffee cakes are mixed by the cake method as described in paragraph 704-d. Additional information on the conventional or creaming style mixing method and ingredient interactions is in paragraph 1507-a, Part XV, Section D, "Cakes and Cookies."

Additional information on producing cakes of this type is Section D, paragraphs 1508, "Panning;" 1509, "Scaling;" 1510, "Baking Conditions;" and 1511, "Baking and Cooling Periods." Particular attention is directed to paragraph 1515-a, "Cake Faults, Causes, and Remedies for Batter Cakes."

Many prefer to eat quick-type coffeecakes warm. Serve these cakes as soon after baking as possible.

705-a(3)—**Cornbread**—This product is a quick bread popular in both northern and southern parts of the United States. Two different recipes have evolved in the Navy-Marine Corps Recipe Service to provide a choice on the different ways this product can be made.