YEAST

Baker's yeast and brewer's yeast are the two main varieties of yeast. Baker's yeast is used for baking and brewer's yeast is used for brewing alcohol. Baker's yeast is valued for its ability to produce carbon dioxide gas. The bubbles are what causes bread to rise when yeast is added to the dough. When the bread is baked, the heat evaporates the alcohol and hardens the dough.

With alcohol production, brewer's yeast is the choice because of its higher tolerance (and higher yield) for alcohol. This results in more alcohol from a given batch of mash. Although either type of yeast will work for the do-it-yourselfer, brewer's yeast should be your first choice.

Yeast Dosage

One pound of yeast should be sufficient to ferment 500 gallons of mash. When estimating your yeast dosage, figure about 0.2 percent to 1 percent of the weight of the original dry weight of a starch feedstock. For example, to each bushel of corn in the mash you would add 0.2 percent to 1 percent of the weight of that bushel (which is about 56 pounds), or about one-tenth to one-half pound of yeast.

For best results, both dry yeast and cake yeast should be dissolved in a small quantity of water at about 90 degrees F and allowed to sit for about 15 minutes before it's added to the mash. This "reactivates" the yeast. If you use a gallon jug for this purpose, you might also add a few tablespoons of sugar to help get the yeast going—but don't overdo it. Remember, too high a sugar concentration can be harmful to the yeast.

for M/M Peter Ruppell
Hearst, Ontario

who inquired about making yeast for bread in the Jan. Catalog

2 oz hops
4 qts water
½ cup salt
6 med. potatoes
1 qt flour
½ cup brown sugar

(Takes 4 days) Boil hops in the water for ½ hr. Strain & cool to lukewarm. Place in earthen bowl, add salt & brown sugar. Mix flour with part of the liquor then add the remainder. Let this stand until 3rd day. On 3rd day add potatoes which have been boiled & mashed fine. Let stand a day, strain & bottle. The mixture should be stirred frequently & kept warm throughout this process.

After the fermented mix has been tightly bottled, stored in refrigerator or cool place, it will keep about 2 mos. Shake mix before using—— allow ½ cup mix for one commercial cake or pkg of yeast.

1 DAY METHOD

Add 1 qt water to 1 pt hops. Simmer 20 min. Add cornmeal until of thick mush texture. When cool, work more corn meal in & pat into cakes. Dry & store.

These are from *Rare Recipes & Budget Savers,* a compilation from a Wichita Ks paper column, "Home Town News." It has a lot of funky homespun items like Root Beer, Shoo Fly Pie, Hand care for cement workers, Curing feathers for hats, etc. $1.50 or 3 for $4.00 postpaid from Wichita Eagle & Beacon Home Town News, Cookbook, P.O. Box 820, Wichita, Kans. 67201.

Sherry
Oakland, CA

Homemade Yeast

Boil 2 ounces of hops in 4 quarts of water for about 30 minutes. Strain and let the liquor cool down to the warmth of new milk. Then add a small handful of salt and ½ pound of brown sugar. Beat up 1 pound of flour with some of the liquor to a smooth batter and mix with the rest of the liquor. After three days add 3 pounds of mashed potatoes. On the fourth or fifth day strain the whole, and the yeast is ready for use.

It should be frequently stirred while making, and kept covered near heat. The yeast must be well stirred before using. It will keep two or three months in a cool place. It is very strong, so only half the usual quantity need be used.

Perhaps the easiest way to introduce this yeast into most wine mixtures is to make a smooth paste of the yeast granules by mixing them with a little tepid water and then spreading the paste on a slice of ordinary toasted bread—just as if you were buttering a piece of toast for breakfast. Then float the toast in the wine with the yeast side down. When you are ready to strain your wine, fish out whatever remains of the floating toast first, and don't forget to use your wooden spoon or a plastic skimmer when you do it.

Homemade Barm

Take as many hops as you can hold in your fingers, put them in a basin, and pour boiling water on them. Let it work for four hours. Take 2 tablespoons flour, 2 tablespoons salt, and 2 tablespoons sugar. Mix all together, then strain your hops, and pour on the mixture. Mix well together and add a teacupful of alum. To work it well, you must always have some old barm to add to it (or yeast, if you have none). Let it stand, keeping warm, for a few hours. Then it will be ready for use. Put it in bottles to keep.

SOURDOUGH STARTER

Mix:

2 cups flour
2 cups warm water
1 packet or cake of yeast

Put 1/2 cup of the mix in a clean jar with a tight cover and the remainder in a covered bowl. This way you won't forget to set aside a half cup as starter for the next time. Put in a warm place overnight. Next day refrigerate the jar of starter. Use the remainder immediately in making pancakes or bread. The starter mixture which has gotten bubbly is called the "sponge."

Use the starter weekly, or "sweeten the pot" by adding **2 cups flour** and **2 cups water.** Let set overnight, then keep all or only the half cup. This is how you sweeten starter that is too sour or make extra for giving away.

Starter will keep quite well for several weeks, although it may separate. If not used sooner, you'd best freeze it or dry it to keep it from spoiling. To transport, either dry it in a flat dish or add enough flour to shape it into a ball and place it in a sack of flour. Water and warmth will activate it.

If your starter turns orange or pink, it's fine—it's just that an odd organism was added. If it turns blue or green, you should throw it out.

My starter is over one hundred years old and originated with the Alaskan Gold Rush. It has never turned an odd color, but it has gotten more sour, and it always separates and looks queer. It creates delicious food, however. I keep a reserve half cup of starter in the freezer so that if I ever forget to set aside the half cup, I won't have lost my starter forever.

1 gallon USA	**=**	**128 fluid ounces USA**
	=	**3.785 liters**
	=	**0.833 British gallon [Imperial measure]**
		[1 British gallon = 160 British fluid ounces = 4.546 liters = 1.201 USA gallons]
1 quart [qt.], liquid USA	**=**	**2 pints [pt.], liquid USA**
[1/4 gallon USA]	**=**	**57.75 cubic inches**
	=	**0.946 liters**
	=	**0.833 British quarts**
1 ounce, fluid or liquid	**=**	**0.03125 liquid quarts [1/32 quart] USA**
[fl. oz.] USA	**=**	**1.805 cubic inches**
	=	**29.573 milliliters**
	=	**1.041 British fluid ounces**
1 ounce avoirdupois	**=**	**0.0625 pounds avoirdupois [1/16 pound]**
	=	**28.35 Grams**
	=	**0.02835 Kilograms**
1 pound avoirdupois	**=**	**16 ounces avoirdupois**
	=	**453.592 Grams**
	=	**0.45359 Kilograms**

Conversion Table

LIQUID MEASURES

BRITISH

1 quart	=	2 pints	=	40 fl oz
1 pint	=	4 gills	=	20 fl oz
½ pint	=	2 gills		
		or one cup	=	10 fl oz
¼ pint	=	8 tablespoons	=	5 fl oz
		1 tablespoon	=	just over ½ fl oz
		1 dessertspoon	=	½ fl oz
		1 teaspoon	=	⅓ fl oz

METRIC

1 litre = 10 decilitres (dl) = 100 centilitres (cl) = 1000 millilitres (ml)

AMERICAN

1 quart	=	2 pints	=	32 fl oz
1 pint	=	2 cups	=	16 fl oz
		1 cup	=	8 fl oz
		1 tablespoon	=	½ fl oz
		1 teaspoon	=	⅓ fl oz

Approx. equivalents

BRITISH	METRIC
1 quart	1·1 litre
1 pint	6 dl
½ pint	3 dl
¼ pint (1 gill)	1·5 dl
1 tablespoon	15 ml
1 dessertspoon	10 ml
1 teaspoon	5 ml

METRIC	BRITISH
1 litre	35 fl oz
½ litre (5 dl)	18 fl oz
¼ litre (2·5 dl)	9 fl oz
1 dl	3½ fl oz

BRITISH	AMERICAN
1 quart	2½ pints
1 pint	1¼ pints
½ pint	10 fl oz (1¼ cups)
¼ pint (1 gill)	5 fl oz
1 tablespoon	1½ tablespoons
1 dessertspoon	1 tablespoon
1 teaspoon	⅓ fl oz

AMERICAN	BRITISH
1 quart	1½ pints + 3 tbs (32 fl oz)
1 pint	¾ pint + 2 tbs (16 fl oz)
1 cup	½ pint − 2 tbs (8 fl oz)

SOLID MEASURES

BRITISH

16 oz = 1 lb

METRIC

1000 grammes = 1 kilogramme

Approx. equivalents

BRITISH	METRIC
1 lb (16 oz)	400 grammes
½ lb (8 oz)	200 g
¼ lb (4 oz)	100 g
1 oz	25 g

METRIC	BRITISH
1 kilo (1000g)	2 lb 3 oz
½ kilo (500g)	1 lb 2 oz
¼ kilo (250g)	9 oz
100g	3½ oz

HOP YEAST

1/2 pound hops
1 gallon water
1 cup fine malt flour
1/2 pound brown sugar

Boil the hops until the water is strong. Then strain and stir in the malt flour. Strain through a coarse cloth. Boil 10 minutes. Cool to lukewarm, and stir in the sugar. Place in a loosely covered jar, keeping it lukewarm. Cover tightly after it has finished working, and keep in a cool place.

3 oz. hops
3½ lbs. rye flour
7 lbs. corn or barley meal
1 gallon water.

Rub the hops and boil them in the water for half an hour. Strain. Stir in rye flour, then corn or barley meal. Knead and roll out very thin. Cut into circles with a tumbler and leave to dry hard in the sun. Wild yeast will infect the biscuits. To use it, crumble a biscuit and soak in warm water with sugar and salt in it and next day use as yeast.

Making Yeasts (Worts)

The nutrient solution for home capture or growth of beers or bread yeasts is made up of a litre (2 pints) of boiled water to which a handful of hops has been added. This is strained and about a quarter of the volume added as grain flour (wheat, rye, barley) with salt, sugar and some ash. When just warm, baker's yeast can be added. Or the solution is left open in a jar in a warm place until it ferments naturally. This is called the wort. To keep the yeast, make the wort into a dough with barley flour, roll out thin and cut into discs, and sun dry as fast as possible. These discs, stored dry, can be broken up and used like baker's yeast. For short term use, rolls of this dough about 3cm (1 inch) in diameter may be kept in cold water in a refrigerator.

Otherwise, make up a solution every week and transfer a cupful of last week's solution to the fresh base, making bread each week to which the yeast solution is added. Bread made this way needs 6-8 hours to rise, or 4 hours in warm weather. The solution can be kept under an air-lock or covered with muslin to keep out 'wild' yeasts.

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A Wort

Boil together 4 litres (8½ pints) or water, 250gm (9oz) sugar, and ¼ cup of salt, and let cool to blood heat. Add 250gm (9oz) flour (mixed with some of the water) and float 1 piece of toast on top. Cover bowl with muslin. Stir occasionally over 3 days.

(Optional: Boil 1oz hops and 1 root of grated ginger in a little water and add malt. Sprout and boil barley if no malt is available.)

After 3 days, add 1kg (2¼lb) boiled and mashed potatoes. Ferment should now start and brown yeasts rise to the top. If so, strain and bottle by nightfall or the next day. Cover bottles with a few layers of muslin or cork lightly (bottle two thirds full). Keep bottles in a cool place. Viable for 6-8 weeks.

For bread, add 1 cup yeast wort to 2kg (4½lb) flour. Ferment in a warm place until risen (2 hours), knead and place in bread tins until again risen. This first batch will give yeast for a second batch (see also yeast storage).

Note.
For rolls, a quarter of the bulk of the flour can be mashed potato or minced acorn or chestnut, and if ½ cup butter or 200gm (7oz) olive oil is added, this bread remains moist for 7-10 days.

(**Ref.** David, Elizabeth, 1979, *English Bread and Yeast Cookery*, Penguin Books, U.K.)

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Bulk Processing to Increase Yeasts

Boil together 30gm (1oz) hops, 60gm (2oz) ground ginger, and 1.5kg (3¼lb) malt for 30 minutes and strain. Let stand for 6 hours. Add flour to bring this to a creamy consistency, then add 1 cup brewer's yeast. Let stand all night and bottle next day.

Store bottles loosely corked.

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Increasing Yeasts

Boil 12 large mealy potatoes, just covered in one pot; strain and mash. In another pot boil 1 handful hops, ½ cup sugar, ¼ cup salt and ¼ cup ash. Skim and strain. Combine potatoes, potato water, hop solution (discarding the hops), and add 1 cup of flour, and a knob of yeast. Store in a large earthenware jar at first at 23.8°C (74.8°F), then in a cool place for 10 days of use.

Add ½ cup of this to new worts, or ½ cup to 9kg (20lb) flour for bread.

Note. Peach leaves can replace hops.
If no yeast is available, take 2 cups milk, add 1 tsp salt, ¼ cup flour and mix well. Keep warm by the fire. If it foams, yeast is present; if not, try again.

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Dried Yeast

Yeast solution or dough kept cold can be preserved for weeks (the dough is kept in cold water). Otherwise, a very large quantity of yeast is made, fine filtered, pressed, and thoroughly dried. It is then rolled thin and placed on an absorbent surface, like blotting paper and dried out of the sun. These pieces are grated and the fine gratings dried and kept in dry dark glass bottles; use as per fresh yeast.

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Cake Yeast

Yeast as pressed cake can be kept under glycerine, or a liquid yeast kept if one eighth the volume of glycerine is added and the solution is kept cold.

Bone or willow charcoal (fine-ground) added to pressed yeast can be made into a dough and dried in sunlight. To use, make a wort solution as before and add charcoal/ yeast; the charcoal falls out as yeast is released into solution.

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Testing Yeast

Good yeast added to boiling water floats. If it sinks, it is no longer viable. Add flour and a little salt to warm solution of sugar. Add some yeast. It should bubble in about one hour. A little malted grain or sprouted grain, ground up, may help.

Wang (in Hesseltine 1986) gives a variety of cultures for Chinese ferments. In China, the cultures or yeasts or moulds go under the general name of chu:-

With a basis of wheat; in summer, crushed wheat is washed, soaked until sour, then steam-cooked. The steamed wheat is spread in beds 6cm (2½ins) deep on clean mats, allowed to cool, then covered with leaves of *Miscanthus sacchariflorus* or *Xanthium sibirium*, and if, after 7 days of incubation, a yellow mass of mould forms, the wheat is rolled into balls, sun-dried, and used as a source of moulds for Chiangs or ferments.

Where wheat flour is used; a dough is made, rolled into balls, then steamed, cooled, fermented and dried as above. These yeasts are also used for alcohol (beer), soybean pastes, and fermented or brewed sauces. (see Chiangs Pages 68-70) *Aspergillus oryzae*, *A.sojae* and other moulds are produced in chu.

With a basis of rice; rice flour is mixed with grasses and herbs, and the juice of *kudzu* (*Pueria lobata*), stem and leaf also added. Formed into oval balls, this base was fermented 30 days under a leaf mat of *Artemisia apiacae*. Grasses such as lemon grass, water rushes, and medicinal herbs were included in the mould base. *Polygonum* became a common ingredient. Such moulds (with *Miscanthus*, *Artemisia*, *Polygonum*) were used, with malt, for digestive upsets.

Moulds and bacterial inoculants, algae, and yeasts are so often 'caught' or are inoculated under dried or fresh leaf and flower materials that the following short list will suggest other sources.

Slimy Bacteria:- (*Bacillus natto*). Caught in China on soaked and steamed soy beans placed in cloth bags and covered with cereal straw. Inoculate 1-2 days at 25-30°C (77-86°F). Straw also provides *Mucor* moulds in cool weather on beans or bean press-cake. (15-18°C) (59-64°F)

Leaf Covers:- Cooked and steamed grains or legume seeds are cooled and covered with leaves of:

- Water reeds and rushes
- Rice straw
- Banana leaves
- Ti (*Cordyline*) leaves
- Bamboo leaves
- Lemon grass
- *Artemisia* leaves
- Hibiscus leaves and flowers
- *Tectonia* (teak) leaves
- Sugar cane leaf

Mixed in with doughs or grain masses are:-

- Mahua flowers
- Hibiscus flowers
- Ginger or *Alpinia* roots (galangal)
- Bean or kudzu juices
- Chopped medicinal herbs
- Fennel and coriander seed

Plants used to reduce aflatoxins are:-
Oxalis spp. (bruised leaves), giving oxalic acid.

Plant extracts used to aid fermentation are:-
Sugars (palm and cane) and molasses (sugar cane) or malt (barley).