

Cut protein cost, not quality

The high cost of meat (especially beef) and concern about the role of dietary fat (calories and cholesterol) in human health have led many people to look for ways to de-emphasize meat in their menus yet still eat well balanced meals that satisfy hunger and desires. Often the solution is to eat more cereal grains, legumes and seeds.

These foods have long been recognized as valuable ingredients in a well balanced diet. They provide good quality protein, carbohydrates, fiber, and vitamins and minerals, particularly the B vitamins and iron. If stored properly, they keep their quality and remain nutritious for months.

Nutritionally, these foods have a lot to offer - and some other pluses, too. Cereals and legumes are quite economical protein sources, can be used to extend small quantities of more expensive protein -- meat, fish, poultry, cheese, eggs -- or be combined in a variety of tasty ways to meet daily protein needs. There is a wide variety of grains and legumes with virtually endless uses in cooking. Thanks in part to the growing popularity of food co-ops, both variety and the availability are increasing.

Cereal grain

Cereal grains are the seeds of plants in the grass family. The most commonly used for food are wheat, corn, oats, rice, barley and rye.

Each seed - each kernel of corn or grain of wheat -- consists of bran, germ and endosperm.

The endosperm makes up the largest part of the grain. It contains most of the starch and protein. The bran is high in fiber, minerals and vitamins. The germ would grow into a new plant if the seed were to sprout, or germinate. It is high in protein, vitamins and minerals, and fat.

Cereal grain products vary in composition, depending on the part or parts of the grain used.

Cereal Grain Products

Enriched white flour is made from the wheat grain endosperm. It is called "enriched" because the thiamin, riboflavin, niacin and iron lost during milling (when the germ and bran are removed) are replaced.

Whole wheat flour (also called graham flour) is made from the entire wheat kernel. It contains the fat in the wheat

germ tends to become rancid over time, so buy whole wheat flour in quantities you can use up fairly quickly (see chart on p. 3 for shelf life of this and other products) and store in a cool place. Whole wheat flour may be used to replace some or all of the flour called for in bread, muffins, quickbreads and pancakes. Wholesale substitution of whole wheat for white enriched flour will change the final product to a heavier, coarser product so it's a good idea to use published, tested recipes at first.

Bulgur (also called cracked wheat) is whole wheat kernels that are par-boiled, dried, relieved of some of the bran and then cracked. It can be cooked like rice -- 2 parts water to 1 part grain -- and used as hot cereal or side dish. It can also be added to bread for a slightly crunchy, nutty texture.

White or polished rice is rice milled to remove the hull, bran and germ, leaving the starchy endosperm. Enriched rice has B vitamins and iron added.

Brown or hulled rice has only the outer hull removed in milling. The germ, bran and endosperm remain. It retains more nutrients than unenriched white rice and takes longer to cook.

Parboiled rice is whole rice grains given a steam-pressure treatment before milling. This treatment forces vitamins and minerals from the outer layers into the endosperm, where they remain after milling. Like brown rice, it is more nutritious and takes longer to cook than regular white rice.

Pearled barley is the barley grain minus the hull and bran. It's most often used in soups and vegetable stews.

Rolled oats are oat grains with the hulls removed that have been steamed and rolled flat. Though most often used as a hot cereal, rolled oats can also be an ingredient in bread and granola.

Rye flour is used mostly for bread. By itself, it tends to make a heavy, compact loaf; so it's usually combined with wheat flour. If made from the whole grain, rye flour must be kept cool.

Soy flour is milled from soybeans. It doesn't have the same baking properties as wheat flour, but it can be substituted for a small portion of the flour in bread and other baked products. Soy flour -- along with rice flour and some other out-of-the-ordinary products -- may be a mainstay for people who are allergic to wheat.

Buckwheat flour is used in baked goods and griddle cakes. Though not a member of the family of grasses, the buckwheat plant has been cultivated and its seeds used as a cereal grain for a long time.

Wheat bran is the milled bran layer of the wheat grain. It is added in small quantities (teaspoons, not cups) to baked goods, cereals and snacks to increase their fiber content. Only a little bran has a pronounced laxative effect; so it's wise to use it sparingly.

Wheat germ is what's left of the wheat kernel after the bran is removed and the endosperm is made into flour. It is sprinkled on breakfast cereal and salads and added to baked

products for its crunch and nutty flavor. Because it is high in fat, it requires refrigeration.

Legumes

A wide variety of dried beans, peas and lentils is available. Beans are good protein sources; and combined with grains, seeds or nuts, they make nutritious, inexpensive main dish foods.

- Black beans or black turtle beans are good in soups or grain/bean recipes.
- Blackeye peas are really beans. They work up well in bean/rice dishes.
- Garbanzo beans are also called chickpeas. Their nutty flavor makes them an interesting addition to tossed salads. They're also good in a main dish or as a vegetable.
- Great northern beans are large, white beans that have a variety of uses in soups, salads, casseroles and baked bean dishes.
- Kidney beans are large, dark red beans good in salads, chili and Mexican dishes.
- Soybeans provide high quality protein that's often used as an extender for ground meat. The beans can be used in casseroles and bean/grain combinations.
- Lentils are quick-cooking, disc-shaped legumes about the diameter of a small pea. They find their main uses in soups and casseroles.
- Green peas may be whole or split. Popular uses include soups, casseroles and dips.

Storing legumes and grains

These products are dry and you want to keep them that way. To protect against moisture, place the store-bagged product in a heavy plastic bag and seal it tightly. Then place the bag in a tightly covered can, jar or plastic pail with clamp-on lid. Store the product in a cool, dry area away from soaps and other products with strong odors, and protect it from insects, rodents and dust. Whole-grain products -- including nuts and sunflower seeds -- need refrigeration to prevent the fat in them from going rancid.

Storage life of legumes and grains

Product	Shelf life
Breakfast cereals	6-12 months, un-opened 2-3 months, opened
Bulgur	6 months
Degermed cornmeal	12 months
Pasta (except egg noodles)	1-2 years
egg noodles	6 months
Rice	
white, parboiled, and precooked	2 years or more
brown and wild	6 months
seasoned mixes	4-6 months
Dry beans, peas, lentils	12 months
Flour	
degermed	6-8 months (airtight)
whole grain	6-8 months (refrigerated)

Complementary proteins

Everyone needs protein. Beef, pork, poultry, lamb, fish, cheese, eggs, milk and other animal products provide what nutritionists call complete proteins; that is: these products contain all the amino acids (the building blocks of proteins) that our bodies need for growth, repair and maintenance.

Many other foods contain some of these essential amino acids. When two foods together contain all the essential amino acids, they are called complementary; that is: one completes the other. So, one way of beating the high cost of animal protein is to combine lower quality protein foods. You can also improve the protein quality of vegetable products by combining them with a higher quality protein like eggs or cheese.

The following combinations can produce the complementary effect:

- Legumes (dry beans, peas, lentils, soybeans, peanuts) + grains (corn, oats, rice, wheat, barley, rye).
Examples: bean/rice casserole, baked beans and brown bread, corn tortillas and beans, peanut butter sandwich.

--Legumes + seeds and nuts (sesame seed, sunflower seed, cashews, almonds, walnuts).
Examples: bean soup with sesame seeds, chickpeas and sunflower seeds in a tossed salad.

--Grains + seeds and nuts.
Examples: brown rice and sesame seeds, sunflower seed bread.

--Legumes or grains or seeds and nuts + animal protein foods (milk, eggs, cheese, meat, fish poultry). Examples: macaroni and cheese, tuna/noodle casserole, rice pudding, beans and franks, split pea soup with ham, cheese ball rolled in nuts.

The following recipes were contributed by Michigan State University graduate students in food science and human nutrition. They hope you'll find some new favorites here!

Crusty Soybean Casserole

2½ cups rice	½ tsp. thyme
5 cups water	½ tsp. summer savory
½ cup dry soybeans, cooked	2 tsp. salt
2 cups corn, frozen or fresh	½ cup tomato paste
1 can tomatoes (16 oz.)	½ cup meat stock (or water)
1 cup chopped onions	1/3 cup grated cheese
½ cup chopped celery	½ cup wheat germ
1 clove garlic, crushed	1 Tbsp. margarine

Place rice and water in saucepan and bring to boil. Reduce to simmer and cook until rice is tender and all liquid is absorbed.

Combine cooked soybeans, corn, tomatoes, onion, celery, garlic, thyme, savory and salt. In another bowl, combine tomato paste and stock. Place half of cooked rice on bottom of oiled casserole dish. Cover with vegetable mixture. Spread tomato paste mixture over vegetables, and cover with remaining rice. Sprinkle with grated cheese and wheat germ. Dot top with margarine and bake for 30 minutes at 350°. Serves 8.

Recipes

Sweet and Sour Lentils over Rice

1 cup lentils	1/2 cup cider vinegar
2 cups water	1/2 cup brown sugar
2 beef bouillon cubes	1 clove garlic, (crushed)
1 bay leaf	1/8 tsp. cloves
1 tsp. salt	1 medium onion, (sauteed)
1/2 cup pineapple juice	

Put lentils, water, bouillon, bay leaf and salt in large saucepan. Bring to boil and simmer 20 min. Add pineapple juice, vinegar, brown sugar, garlic, cloves and onion. Heat until bubbly. Serve over brown rice. Serves 4.

Barley Apple Pudding

1 cup stewed apples	1/2 tsp. grated nutmeg
2 cups cooked barley	1/2 tsp. ground cinnamon
juice of 1 lemon	2 eggs
1/2 cup honey	

Stir apples, barley, lemon juice and honey together in large bowl. Add spices. Separate eggs. Beat yolks until creamy; stir into mixture. Beat whites until stiff; fold in. Turn pudding into buttered 1-q. baking dish. Bake 35-40 min. at 350° F. Serves 4.

Soybean Spread

2 cups cooked soybeans	1 cup chopped fresh parsley
1 1/2 slices chopped bacon	1 tsp. dried oregano
1 cup chopped onions	3/4 cup mayonnaise
2 cloves garlic, crushed	1 Tbsp. soy sauce

Mash soybeans with leftover cooking liquid. Set aside. Saute bacon for 5 min. Add onions, garlic and parsley and saute another 5 min. Remove from heat; mix in mashed soybeans, oregano, mayonnaise and soy sauce. Add more mayonnaise if needed to get a spreading consistency. Spread on whole grain bread or crackers.

Tabouli

1 1/2 cups uncooked bulgur	pinch garlic
3 cups stock or water	2 Tbsp. chopped chives
1 tsp. salt	2 Tbsp. chopped fresh mint leaves
1/2 cup cooked white beans	juice of 2 lemons
2 tomatoes, chopped	1/2 cup chopped parsley
3 Tbsp. oil	lettuce or fresh spinach
pepper to taste	

Bring stock and salt to a boil. Add bulgur slowly and keep boiling 5 min. Remove from heat, cover pot tightly and set aside for 1 hour. Drain excess water and chill the bulgur. Toss thoroughly with remaining ingredients; taste for seasoning. Serve on bed of lettuce or spinach. Serves 8.

Lentil Burgers

2 cups cooked lentils	1 small onion, minced
1 egg	tomato juice
1/2 cup cracker crumbs	salt and pepper

Mix all ingredients together, using just enough tomato juice to hold mixture together. Form into 6 patties. Fry in a small amount of oil or bacon fat. Serve in whole wheat or rye buns.

Carolyn J. Latkey
 Carolyn Latkey
 Food and Nutrition Specialist



1P-5M-3:81. Price 10 cents. Single copy free to Michigan residents.



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