
Oregon Agricultural College Extension Service

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Substitutes for Meat



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SUBSTITUTES FOR MEAT

As a nation we have depended largely upon meat as a source of protein, i. e., tissue-building food. At the present time, however, meat is not only scarce but also needed by our soldiers and Allies. Eggs, which often take the place of meat, are high in price because of the expense of feed. It is therefore necessary for fish, milk, cheese, and tissue-building vegetables to figure prominently in our menus as a substitute for meat and eggs.

Vegetables which may be substituted for meat in the diet are beans, both green and dry, peas and lentils. Soy beans and vetch may be used in place of beans, and both are high in tissue-building properties. Nuts are also excellent meat substitutes.

COTTAGE CHEESE—AN INEXPENSIVE MEAT SUBSTITUTE

Cottage cheese is one of the most important meat substitutes, say specialists of the United States Department of Agriculture. It contains a larger percentage of protein (the chief material for body building) than most meats and furnishes this material at a lower cost. In every pound of cottage cheese there is about one-fifth of a pound of protein, nearly all of which is digestible. Meats, on the other hand, usually contain less protein and besides have a certain waste, such as bone and other inedible material. A pound of cottage cheese daily would supply all the protein required by the ordinary adult engaged in a sedentary occupation.

The following table shows that cottage cheese is much cheaper than most meats in furnishing protein for the diet.

1.27 pounds sirloin steak
1.00 pounds round steak
1.37 pounds chuck rib beef
1.52 pounds fowl
1.46 pounds fresh ham
1.44 pounds smoked ham
1.58 pounds loin pork chop
1.31 pounds hind leg of lamb
1.37 pounds breast of veal

In addition to protein, energy for performing body work must be furnished by food. As a source of energy also, cottage cheese is cheaper than most meats at present prices. The following table shows the comparison when energy is considered.

On the basis of energy supplied, one pound of cottage cheese equals:

8 $\frac{1}{8}$ ounces sirloin steak
11 $\frac{1}{4}$ ounces round steak
11 $\frac{1}{4}$ ounces chuck rib beef
10 $\frac{3}{4}$ ounces fowl
5 $\frac{1}{2}$ ounces fresh ham
5 ounces smoked ham
6 ounces loin pork chop
7 $\frac{1}{8}$ ounces hind leg of lamb
12 $\frac{3}{4}$ ounces breast of veal

HOW TO USE SKIM MILK

There are many places in which skim milk is not used as completely as it might be. On farms there is often more than can be profitably fed to calves or pigs. In creameries much of it is made into cottage cheese.

Valuable in Combination. Many people do not realize how nutritious skim milk is. They imagine that because it so generally has little or no commercial value it is hardly fit for human food. As a food it is not so valuable as whole milk, and can not take the place of the latter in the diet of children. Nevertheless, skim milk can be used to great advantage in combination with other food materials, especially in cooking, and is altogether too valuable to be wasted, according to home economics specialists of the United States Department of Agriculture.

Food Materials in Whole Milk. A quart of whole milk weighs $34\frac{1}{2}$ ounces, or a little more than 2 pounds, nearly 30 ounces of which is water. The remaining solid matter contains very useful food materials. Slightly more than 1 ounce is protein, a very important muscle builder, and one of the most expensive of the substances needed by the body. About $1\frac{1}{3}$ ounces consists of butter fat, and $1\frac{1}{2}$ ounces of milk sugar. These two materials are used by the body to provide it with energy, much the same as fuel is used to produce steam and power in the engine. The quart of milk also contains about one-quarter of an ounce of mineral matter, small quantities of which are very necessary for the growth and general upkeep of the body.

Skim Milk a Tissue Builder. As the fat is separated to form the cream some of the protein, milk sugar, and mineral matter go with it, but by no means all. The protein remains; therefore a quart of separator-skimmed milk provides slightly more of the indispensable and costly material than does a quart of whole milk. It contains in all about 1.5 ounces of protein, $1\frac{1}{4}$ ounces of milk sugar, about $\frac{1}{4}$ of an ounce of mineral matter, and a little fat, the last named depending, of course, upon the completeness of the separation. This means that, quart for quart, it would furnish the body with slightly more protein and milk sugar than whole milk does, and practically the same quantity of mineral matter, though far less fat. In other words, as a tissue builder it is equal to whole milk, though as energy yielder not nearly so good. Since, as a rule, the tissue-building materials are contained in the more expensive foods (meat, eggs, etc.), and the energy-yielding materials can be largely provided by cheaper foods (bread and other cereal foods, fats, potatoes, etc.) it seems doubly wasteful not to use skim milk.

Buy Milk Instead of Cream. Those who buy milk seldom have much skim milk to use unless they follow the custom of skimming their own cream. That there is economy in so doing is shown by the following: A quart of whole milk usually sells for the same price as a half pint of cream, which contains about one-fifth ounce of protein, $1\frac{1}{2}$ ounces of fat, not quite $\frac{1}{2}$ ounce of milk sugar, and very little mineral substance. If this is compared with a quart of whole milk, which very commonly can be purchased for the same sum, it will be seen that the purchaser in buying a half pint of cream instead of a quart of milk sacrifices nearly an ounce of protein, $1\frac{1}{2}$ ounces of sugar and 1.5 ounce of mineral

matter. He gets, of course, a trifle more fat—about 1.5 ounce, or a level teaspoonful—but this is small in comparison with what is sacrificed. Some people, therefore, buy whole milk instead of cream in order to have for family use the nourishment contained in the milk after it has been skimmed. Home-skimmed milk is, of course, richer in fat than that which has been skimmed by a separator, but it can be used in the same way.

Skim Milk in Cooking. The uses of skim milk are many. In cooking it adds to quality as well as to food value. If used in bread in place of water it adds about as much protein to one pound of bread as there is in an egg. Skim milk used in place of the usual half milk and half water, of course, increases the quantity of protein in a loaf by the amount that is contained in half an egg. The saving involved in the use of skim milk in bread, however, is small compared with that involved in its use in the preparation of cereals, for, while in bread the milk is only about one-third of the flour, in the preparation of cereals the volume of milk is usually three or four times that of the cereal. To cook a cupful of cereal in 3 cupfuls of skim milk instead of 3 of water adds as much protein as that contained in 3 eggs.

In Vegetable Milk Soups. There are many dishes which may be described as vegetable milk soups, usually made by combining milk and the juice and pulp of vegetables. This mixture is then thickened with flour and starch and enriched with butter or other fat. If a fire is kept all the time and the cost of fuel need not be taken into consideration, the following method is recommended as a means of utilizing skim milk: Chop the raw vegetable or cut it into small pieces. Put it with the skim milk into a double boiler and cook until the vegetable is tender. The mixture can then be thickened and enriched as described above. By this method no part of the vegetable is thrown away and the liquid of the soup, instead of being part milk and part water, is all milk. A soup so made, therefore, usually has about twice as much protein as that made in the other way, and has the additional advantage of a particularly good combination of mineral substance, for milk is rich in calcium and phosphorus, and the vegetables are rich in iron.

In making these soups use is made of many of the parts of the vegetable that are ordinarily thrown away, namely, the outer and tougher leaves of lettuce, which has a higher iron content than most other vegetables; the tops of celery; and even the tops of young onions. Small quantities of cooked vegetables left over from other meals may be utilized in these and in other kinds of soup.

If in making these soups the vegetable is chopped finely in the meat grinder, they need not be strained before being served. If the vegetable that are ordinarily thrown away; namely, the outer and strainer, or such vegetables as carrots or potatoes may be cut into slices and left in the liquid, in which case the dish resembles a vegetable chowder. Those soups may be thickened with stale bread.

Soup Recipe—

- 1 qt. spinach (4 ounces)
- 1 thin slice onion
- 2 slices stale bread (2 ounces)
- 1 qt. skim milk.

Put the spinach and onion through the meat chopper, following them by the bread in order that there may be no waste. Put into a double boiler with the milk and cook until the spinach is tender.

Cereal Milk Pudding—

There is a class of extremely valuable dishes which are sometimes called "cereal milk puddings," usually made by cooking equal volumes of a cereal (usually rice) and sugar in 12 times the volume of milk—for example, $\frac{1}{4}$ cupful of rice, $\frac{1}{4}$ cupful of sugar, and 3 cupfuls of milk. When a fire is kept constantly and the cost of fuel need not be considered, such a dish may be made with skim milk, and very much more than 3 cupfuls of the milk used. As the water evaporates, the dish becomes richer and richer in protein.

Oatmeal may be substituted for rice in the above-described pudding and adds somewhat to the protein value, though the quantity of cereal used is so small that this is not important.

Thin cereal-milk puddings, made by slowly cooking down until thick 10 or 12 parts of skim milk and 1 of rice, oatmeal, or similar cereal, may be used in place of cream with stewed fresh fruits or cooked dried fruits or baked apples.

SOUPS

Cream soups because of the large amount of milk, may form the main dish of the meal and offer splendid opportunity for using the odds and ends of vegetables, cereals and fish or meat.

Thin White Sauce—

The following is the foundation for all cream soups:

1 T fat	1 c milk
1 T flour	$\frac{1}{2}$ t salt

Make paste of flour and small amount of milk. Heat remainder of milk, add paste, cook in double boiler or over hot water 30 mins. Add butter just before serving.

Cream of Salmon Soup—

3 c milk	2 T butter or drippings
3 T flour	Speck salt and pepper
$\frac{3}{4}$ c canned salmon or any left over fish.	

Make white sauce of milk, flour, butter, salt and pepper. Break salmon in small pieces, add to white sauce; reheat; stir well, and serve.

Cream of Pea, Bean, or Vetch Soup—

3 c thin white sauce
$1\frac{1}{2}$ c peas or cooked beans or cooked vetch
3 c water

Crush beans, peas, or vetch to pulp, add to hot white sauce. Reheat, beat and serve.

Abbreviation Key—

c=cup
T=Tablespoon
t=teaspoon

Peanut Soup—

Use ground peanuts or peanut butter

1 qt. milk

4 T flour

1½ t salt

6 T peanut butter worked up with a little hot water to cream consistency. Mix flour with a small amount of cold milk. Heat rest of milk in double boiler over hot water; add flour and peanuts mixture to warm milk. Cook as white sauce. Serve hot.

Cream of Corn Soup—

1 pt. corn pulp (either cooked dried corn or canned corn, or fresh may be used)

1 qt. thin white sauce or milk

1 slice onion

Salt and pepper.

Cook corn until soft enough to press through sieve. Add to white sauce, in which the onion has been cooked. Season. Serve hot, Baked bean soup may be prepared in the same way.

Cream of Tomato Soup—

1 pt. tomato juice

1 pt. thin white sauce

½ t soda

Salt

Heat tomato juice. Have white sauce hot; add soda to tomato just before serving. When ready to serve add tomato to white sauce and serve at once.

Stewed Salmon—

2 lbs. salmon

½ c carrot, diced

½ c potatoes, diced

¼ c onion cut fine

2 T butter or drippings

1 T flour

1 small turnip

1 sprig parsley

½ cup celery, diced

2 c water

Boil vegetables in water until tender. Put the liquor from cooked vegetables to boil, and when boiling add fish cleaned and tied in clean cloth. Boil 20 minutes. Take out the fish, add flour, butter, and vegetables to gravy and boil until it thickens, stirring constantly. Pour over fish, garnish with lemon and parsley and serve.

Mexican Fish—

1 small onion chopped fine

3 T butter

2 T flour

½ green pepper

1 c strained cooked tomatoes

½ lb. codfish that has been freshened and simmered (any fish may be used).

Cook onion in butter, then add the flour. Add tomatoes. Cook 10 minutes. Add freshened codfish and simmer 10 minutes.

Plattered Fish—

2 lbs. halibut cooked one-half hour with 2 bay leaves, 1 onion, and salt to taste. When cooked pick the fish apart, remove skin and bones. Put plenty of drippings on a platter, put the fish on top, then cover with 1 cup grated cheese and 1 pint of thin white sauce. Add finely cut parsley and sprinkle with paprika. Put into oven and bake about 10 or 15 minutes.

Kedgerie (Rice Fish)—

1 egg	$\frac{1}{2}$ t salt
2 c boiled rice	4 T butter
$\frac{1}{2}$ c cooked fish	Speck pepper
2 T chopped parsley	Grain cayenne

Blend and heat to boiling, add raw, well-beaten egg. Serve at once.

Fish Balls—

1 c cooked codfish or any cold fish, shredded
 2 heaping cups cooked potatoes, mashed
 Salt, pepper, cayenne, and celery salt to season
 1 egg
 $\frac{1}{2}$ t drippings

Make into ball and fry. If fish is hot and added to hot mashed potatoes, 2 teaspoons baking powder may be added and mixture beaten hard and allowed to cool and set before making balls. This mixture may be baked in oiled baking dish, or fried as hash.

Salmon Loaf—

1 can salmon (may use any fish)
 1 c fine stale bread crumbs
 1 egg
 3 T melted butter or drippings
 Salt, pepper, and minced parsley
 $\frac{1}{2}$ c milk, more or less to bring to the consistency to shape.

Strain off liquor and save it. Remove all bones and skin. Mash the fish finely. Add the bread crumbs, beaten eggs or milk, and other ingredients. Make into loaf and bake.

Sauce for Above—

1 c sweet milk	Liquor of fish
1 T cornstarch	1 egg
1 T butter or drippings	Juice of 1 lemon

Make as white sauce. Egg may be omitted and tomato used in place of milk, when lemon would also be omitted.

Clam Chowder—

6 clams (chopped)	1 onion chopped
$\frac{1}{2}$ lb. potatoes (diced)	1 oz. diced salt pork
1 pt. milk	3 qts. water

Cook all together until tender.

Fried Clams—

1 pint clam—clean, drain from liquor, and chop	
$1\frac{1}{2}$ c flour	$\frac{1}{4}$ teaspoon salt
2 t baking powder	$\frac{2}{3}$ c milk and clam liquor
1 egg	

Mix and sift dry ingredients, add milk gradually and well beaten egg. Add chopped clam. Drop from spoon to well oiled frying pan.

Escalloped Corn with Peanuts—

Butter baking dish. Put in alternate layers of canned or soaked and cooked dried corn, ground peanuts, and bread or cracker crumbs; add salt and pepper to cracker layers. On top layer add 2 tablespoons butter in fine lumps. Heat in oven until butter melts. Heat enough milk thoroughly to moisten and pour warm milk over. Bake slowly until well done. Cheese may be used in place of nuts. Any vegetables may be used.

Baked Cowpeas and Cheese—

- 1 T butter
- 1 T finely chopped onion
- 1 T finely chopped sweet green pepper or celery
- 2 c cooked cowpeas
- $\frac{1}{2}$ c grated cheese

Press the peas through a sieve to remove the skins and mix with the cheese. Cook the onion and pepper or celery in the butter or fat, being careful not to brown, and add them to the peas and cheese. Form into roll, place in a buttered dish and cook in a moderate oven until brown, basting occasionally with butter or other fat and water. Serve hot or cold as meat loaf.

Peanut Butter Loaf—

Thin the peanut butter to the consistency of heavy cream with hot water.

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| 1 c peanut butter cream | Salt to taste |
| 2 c cooked rice | 1 T chopped onion |
| 1 egg | Juice of 1 small lemon |
| $\frac{1}{3}$ t celery salt | |

Combine. Bake in moderate oven about 30 minutes or until nicely browned. Serve with brown sauce or tomato sauce.

Brown Sauce—

- 2 T butter
- 2 T flour
- 1 c liquid, milk or stock
- $\frac{1}{4}$ t salt

Melt butter, add flour and salt and brown. Add cold liquid slowly and cook until thickened. This sauce is improved if 2 T of tomato juice is added.

Tomato Sauce—

- $\frac{1}{2}$ c juice and pulp of tomatoes pressed through a collander
- $\frac{1}{2}$ T butter
- $\frac{1}{2}$ T flour
- $\frac{1}{4}$ t salt

Baked Vetch—

*1 pt. vetch (raw) (either Pearl or Black)

1 t soda

1 slice salt pork or bacon

2 t salt

½ T mustard (ground)

2 T molasses

2 T vinegar

Dash of cayenne

½ c strained tomatoes or catsup

Hot water enough to cover

Soak vetch over night. Add soda and cook until tender. Rub through hands to remove hulls. Put pork in bean jar, add other ingredients, and bake four or five hours.

Squash Cakes—

1 c squash (mashed)

½ c finely cut nuts

½ c bread crumbs

1 T chopped cheese

2 T onions (if desired)

1 egg

1 T chopped parsley (if desired)

Salt to taste.

Make into cakes and fry. Serve with or without brown or tomato sauce, or bake in well oiled baking dish.

Prune Loaf—Imperial—

2 c rice (cooked)

1 c crumbs

1 c grated cheese

½ c strained tomatoes

1 c prune pulp

1 small chopped onion

1 ½ T salt

2 T parsley

1 egg

Bake in loaf one hour in moderate oven.

Escalloped Beans—

Soak the dried green beans for 24 hours. Cook until tender; drain. Place alternate layers of bread crumbs, and cooked beans, cover with a few pieces of bacon, then bread crumbs. Pour in enough milk to cover beans. Season to taste. Bake about ½ hour.

Peanut Cakes—

1 c chopped roasted peanuts

1 t salt

2 c mashed potatoes

1 t onion juice

¼ t grated nutmeg

1 T chopped parsley

½ t white pepper

1 well beaten egg

Mix as given, form into cakes and fry.

Pea Loaf—

½ c pea pulp

Few drops onion juice

¾ c soft crumbs

½ t salt

¾ c milk

1 egg slightly beaten

1 T sugar

2 T melted butter

* See note at end of bulletin, page 12.

If bread is dry soak it in the milk. Mix in order given, pour into buttered dish, cover and steam until set. Serve hot with white sauce made by using stale bread crumbs instead of flour.

Vegetarian Loaf—

1 c toasted bread crumbs (entire or graham)	
1 c nuts	2 t grated onion
1 c corn pulp	1 T minced parsley
½ c cheese	½ c whole wheat flour
2 eggs	1 c chopped celery

Mix ingredients together thoroughly. Press in small bread pan or baking dish and bake or steam one hour. Steaming preferred.

Peanut Rice Loaf—

2 c rice (after cooking)	2 T salt
1 c chopped peanuts	¾ c cheese
1 c cooked prunes	2 T chopped parsley

Bake in loaf slowly for 1½ hours or until well browned. Serve hot with or without tomato sauce.

Stuffed Peppers—

Soak dried green peppers 12 hours; boil until tender; remove from water and stuff as you would any peppers. Fresh green peppers may be used. The following stuffing may be used.

1 c cooked rice
2 t peanut butter dissolved in ⅔ c tomato pulp
1½ t salt
½ T finely cut onion
⅓ c cheese
1 T finely cut parsley

Peanut and Vetch Loaf—

½ c shelled roasted peanuts (ground)
1½ c boiled vetch (not ground)
1 c toasted bread crumbs
2 t drippings
2 t salt
2 T tomato catsup
½ c milk (more or less as needed)

Soak vetch over night. In the morning add 1 teaspoon soda; cook until tender (about one hour). Wash in cold water, rubbing between the hands to loosen the hulls. Chop the nuts, add the ingredients as given, using enough milk to form the mixture into a loaf. Put in a pan, set pan in vessel of water, and bake one hour.

Vetch and Rice Patties—

Use equal parts of cooked vetch and seasoned left-over rice and egg to bind it together. Make into little cakes or patties and fry. A bit of parsley may be added if desired.

Meal and Vetch Polent—

3 c boiling water	2 T butter or fryings
1 t salt or salt to taste	2 c cooked vetch
1 c cornmeal	3 T finely cut cheese

Make a mush of the boiling water and corn meal, and cook thoroughly. When done and still hot add the cheese and butter and stir until cheese is melted; then add the cooked vetch. Mix well. When cold slice and fry a golden brown in a little fat. $\frac{2}{3}$ cup of uncooked vetch will give two cups cooked vetch. Cook vetch as in above recipe. This may be made wholly of meal.

Baked Macaroni with Peanut Butter—

1 c macaroni	$\frac{3}{4}$ cup bread crumbs
2 c milk	$3\frac{1}{2}$ T peanut butter
1 t salt	

Cook macaroni in boiling salted water. Pour over cold water to separate. Scald the milk and add it gradually to the peanut butter so it will not lump. Turn macaroni into buttered baking dish. Pour over it the milk mixture, cover closely and bake slowly for 40 minutes. Sprinkle with crumbs and brown in hot oven.

Boston Roast—

1 lb. cooked kidney beans or equivalent quantity of any cooked beans
 $\frac{1}{2}$ lb. cottage cheese or American cheese
 Bread crumbs
 Salt

Mash the beans or run through food grinder. Add the cheese and bread crumbs enough to make the mixture into a roll. Bake in moderate oven, basting occasionally with butter or other fat and water. Serve with tomato sauce. Three canned pimentos chopped may be added to the loaf. An egg will make it hold its shape better.

Cottage Cheese Nut Loaf—

1 c chopped nuts (any nuts may be used)	
1 c cottage cheese	1 T butter
1 c bread crumbs	Juice of $\frac{1}{2}$ lemon
2 T chopped onion	Salt and pepper

Cook the onion until tender in the butter or other fat and a little water. Combine the other ingredients and moisten with the onion mixture. Pour into a shallow baking dish and brown in the oven.

Welsh Rarebit—

1 T butter	1 c milk or tomato juice
$\frac{1}{2}$ c cheese	$\frac{1}{4}$ t mustard
1 t cornstarch	Salt and paprika

Make sauce of butter, cornstarch and milk, cook, add cheese. Stir until melted; add seasoning and serve on toast.

USE OF LEFT-OVERS

Any left-over material, such as meats, fish, vegetables, rice, macaroni, or breakfast foods may be used to form meat substitutes. If the material is in large pieces it may be run through a meat chopper, mixed with bread crumbs, milk or eggs, or both, and seasoned with salt, pepper, celery salt, or any seasonings desired. Chopped parsley, nuts, onion, etc., may be added if desired. Mold into cakes and fry or put in oiled baking dish and bake.

SUGGESTED COMBINATIONS

1. Tomato pulp, ground peanuts, bread crumbs.
2. Rice, cheese, tomatoes, bread crumbs.
3. Baked beans run through sieve, tomato or catsup to taste. Mold, dip in bread crumbs and egg.
4. $\frac{1}{2}$ cup hominy cooked in 2 cups tomato pulp seasoned with salt, pepper, paprika and 2 tablespoons butter. Mold and fry.
5. Left-over salmon or any fish and peas.
6. Cold meat, tomato, and potato.
7. Cold sausages cut into bits, mixed with cold potato, bread crumbs, rice or left-over cereal.
8. Squash, ground cheese, bread crumbs.
9. Oatmeal mush, cheese, cold corn.
10. Any cold cereal, tomato catsup and seasoning.

Note: Vetch is a kind of bean which, until recently, has been practically unknown as a food except for animals.

There are two varieties of vetch, the white or pearl, and the black.

The black is grown in the northwest, while the white is grown in the central west and some of the southern states. The black vetch makes a much more palatable-looking food if the dark husk is removed. This may be done by soaking it in soda water, and parboiling, when the husks are loosened.

In palatability, digestibility, and nutritive value, vetch compares very favorably with beans, while its delicate and pleasing flavor leads many to consider it equal to them. In using vetch as a food, it may be prepared in the same way as the navy bean, baked or boiled. It may be made into meal by grinding it in some small grinder at home, or as a regular grist at the miller's.

The use of vetch is recommended as a food for all who produce it and all others who can easily procure it. All foods that will give a food value similar to the staples should be utilized at the present time, so that the extra staples may be sent to the Allies. It is principally for this purpose that the following recipes have been worked out.