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COOKERY OF THE CHEAPER CUTS OF BEEF.

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Margaret Cunningham.

Flora Hull.

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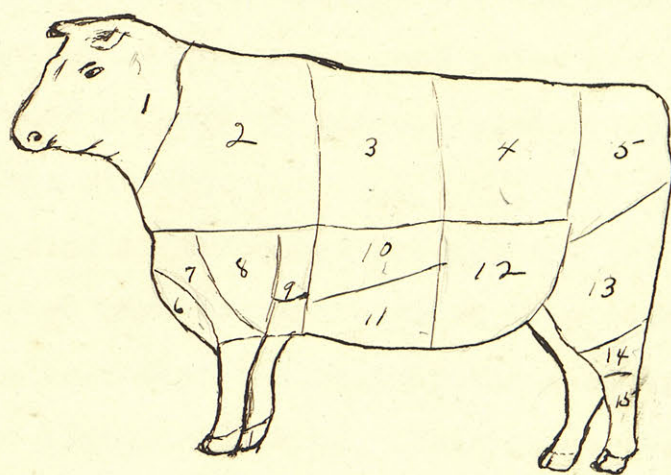
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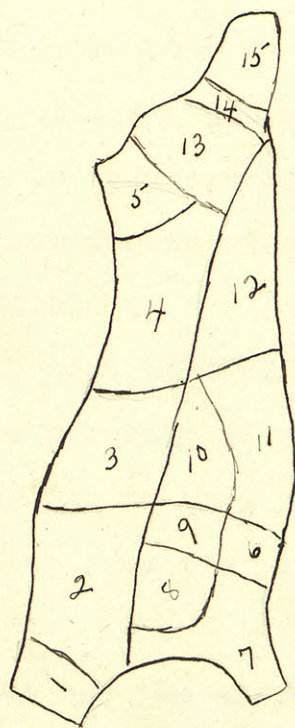
Thesis Outline.

Introduction:

1. Importance of the study of the cheaper cuts of meat.
2. Place in the dietary.
3. The cuts of beef.
4. The relative nutritive value of different cuts.
5. Relative cost of different cuts.
6. Cookery.
 - Time.
 - Temperature.
 - Methods of cooking.
7. Experiments.
8. Use of left-overs.
9. Conclusion.



1. Neck
2. Chuck,
3. Ribs,
4. Loin,
5. Rump,
6. Brisket,
7. Shank.
8. Shoulder Clod,
9. Cross-ribs,
10. Plate,
11. Navel.
12. Flank,
13. Round,
14. Second cut of Round.
15. Shank.



The subject of the cookery of the cheaper cuts of meats is one which is probably very little thought of, and much less studied. One concludes that unless he can pay a good price and secure the popular or choice cuts, that he must go without meat or limit it to a very great extent in his dietary.

This conclusion is erroneous because the cheaper meats are as nutritious and often more highly flavored than some of the more expensive cuts. It is true that the most of the cheaper meats require a greater length of time for cooking. This is no factor against them in winter because as a rule the fire is kept up most of the day, and it is no waste of fuel to cook the meat a long time; even in summer there are usually several days of each week when long fires are used.

Since the invention of the fireless cooker, there is no reason why every one should not own one as they are of little or no expense. With this cooker the extra cost and inconvenience of keeping up a fire on a summer day is dispensed with.

If, then, we can cook cheap meat both winter and summer without extra expense for fuel, and since the meat is as nutritious and often more highly flavored, does it not pay to give a little study to the ways to prepare the cheaper cuts to take the place of high priced, but no more nutritious cuts?

Many people cannot afford to buy the expensive meats for every day use, and, having the false idea that the cheaper pieces are undesirable, they deprive themselves of much needed proteid; or if they buy meat they must lessen the cost by going without some other necessary article of diet. In either case the body is not properly nourished. A bulletin on Scientific Research, in treating the subject of

errors in food economy, states that one of the greatest mistakes commonly made in food economy is that the costlier kinds of food are used when less expensive are just as nutritious, and easily made as palatable.

Very few housewives stop to realize that the cost of food is the principal item in living expenses, and that it might be materially lightened by a little careful study of the cost and nutritive values of the different foods.

Place in dietary.

As protein builds up and repairs tendons and muscles, and supplies the albuminoids of blood and other fluids, we can see that the body would not be properly nourished without protein of some kind. Individuals require different amounts and kinds, according to the health, sex, occupation, and climate, but all must have some protein.

There are the different proteid foods, meat eggs, cheese, milk, and the vegetable proteids of cereals, nuts, peas and beans. It is quite possible to live without meat, using for the proteid of food, milk, cheese, eggs, and the vegetable proteids.

But in spite of all the advice of vegetarians, most of us still have a desire for meat as one article of food, and would find a dietary without it monotonous.

The following brief table gives the actual digestible and indigestible part of the more common cuts, so that it may be closely figured as to which pieces are actually cheap, and which, though low priced, are really expensive.

Cuts of beef	Refuse	Protein	Fat	Undigestible	Calories value
Loin	13.1	17.1	11.1	1.1	785
Round	8.1	19.5	7.3	1.1	607
Shoulder	18.1	16.4	4.4	1.0	490
Ribs	22.6	15.2	9.3	1.1	675
Neck	29.5	15.1	5.9	.9	530
Liver	---	20.5	4.9	.8	555
Rump	14.0	19.1	11.1	1.1	820

It is noticed that round compares favorably with the expensive loin, being slightly less nutritious; it also has less waste. Shoulder, ribs, and neck are not far below in the nutritive value, but they contain more refuse. The nutritive value of rump is greater than that of loin. Liver, although lacking in fat, has a large per cent of protein, and is the most completely digested.

The composition of the different proteid foods is as follows:

Material	Protein	Fat	Calorie	Undigestible	Cost
Beef Flank	20.5	11.0	1105	1.1	06
Round	19.5	7.3	670	1.0	15
Shoulder Clod	16.4	4.4	490	1.1	08-10
<u>Chuck</u>	<u>16.3</u>	<u>6.6</u>	<u>580</u>	<u>.7</u>	<u>10</u>
Beef Average	18.1	7.3	711	.9	.10
Milk	3.2	3.9	320	.4	.02
Cheese	25.6	32.5	1890	2.4	.20
Eggs	13.0	9.5	730	.8	.08
Beans	17.9	1.6	1440	8.6	.06

A few comparisons will show that it is not more economical to buy the other protein substances in the place of meat.

For instance, meat costs five times as much as milk a pound, but multiplying the nutrition of milk by five to get the amount for .10 equals:

	Protein	Fat	Calorie	Undigestible	Cost
Milk	16.0	19.5	1600	2.0	.10
Cheese	18.1	7.3	1711	2.9	.10

The result is more protein in the meat but less fat, but averaging about the same nutrition.

The following is a table of nutrients of different protein foods for ten cents.

Material	Protein	Fat	Undigestible	Calorie	Cost
Average Beef	18.1	7.3	.9	711	.10
flank					
round					
shoulder clod					
chuck					
Milk	16.0	19.5	2.0	1600	.10
Cheese	12.8	16.2	1.2	945	.10
Eggs	10.2	7.6	.6	584	.10
Beans	29.8	2.6	14.3	2400	.10

It will be noticed from the outline that cheese, which is usually considered to be so very nutritious, when figured to the same cost of average meat is not very much more nutritious. Although more nutritious is less valuable as a source of proteid. Another objection to cheese as a proteid source is, it is too concentrated to use regularly. Eggs are less nutritious than meat for the same amount of money. Beans show a much higher nutritive value, but are objectionable because the vegetable proteid intermingled with the cellulose is very hard to digest, and so much is undigested that it requires an over supply of beans to furnish the proper amount of nutrition.

In order to be economical in the use of meat, it is necessary to have a knowledge of the cuts of meat, and also of appearance of meat in good condition. We even believe that for those who can and do afford the higher priced meats for every day use, the cheaper cuts would often be a desirable change on account of the different flavors and methods of cooking. With this knowledge there is a chance for greater variety in the diet.

The accompanying diagrams will show the position of the different cuts on the animal, both before and after being dressed. With a little care and attention one could readily learn to distinguish between the different pieces.

As to the appearance of the meat, the color should be a bright red mottled with fat; the odor must be sweet. A dark red color indicates that the animal was old, while the meat from a young animal is very light colored.

A table is given of the nutritive and fuel values of the different cuts of beef, also of the refuse in each case:

Beef	Refuse	Protein	Fat	Calories
Brisket	23.3	12.0	22.0	1165
Flank	1.4	20.5	11.0	845
Loin	13.1	17.1	11.1	785
Porter House	12.7	19.1	17.9	1110
Sirloin	12.8	16.5	16.1	985
Neck	29.5	15.1	5.9	530
Plate	17.3	13.0	15.5	895
Ribs	22.6	15.2	9.3	675
Round	8.1	19.5	7.3	670
Shank	36.5	14.0	3.9	425
Shoulder Clod	18.8	16.4	4.4	490
Brains	----	8.8	9.3	555
Heart	5.9	14.8	24.7	1320
Sweetbreads	----	16.8	12.1	825
Tongue	----	18.9	9.2	740

A list of prices of the cuts of beef is given; with the brief table just given, this shows which are the really inexpensive pieces.

Brisket	-----	.05
Flank	-----	.06
Loin	-----	.20
Porter House	--	.20
Sirloin	-----	.20
Neck	-----	.06
Plate	-----	.06
Ribs	-----	.10 - .12
Round	-----	.15
Rump Roast)---	.10
Shoulder clod	.08 -	.10
Brains	---	--
Heart	-----	.06
Sweetbreads	--	--
Tongue	--	---
Shank	-----	.03 - .06

Flank is the cheapest cut, excepting some of the internal organs, and it has very little waste.

There is a great deal of refuse in neck, but it is still a very economical piece.

Ribs, although not high priced, are expensive because of the large amount of waste.

Round has a small per cent of refuse and can easily take the place of the more expensive steaks.

Rump is among the cheapest cuts, it having a small amount of waste and high nutritive value.

Shank is only economical when used for soup.

The heart, brains, tongue and sweetbreads are usually inexpensive and add variety.

Porter House and loin cuts are more expensive than their nutritive value warrants.

The cheaper cuts of beef are very unpalatable if not properly cooked; but the best steak may be spoiled in the cooking. The cheaper cuts require a little more care than the others.

Cooking meat changes the insoluble collagen between the muscle fibers into soluble gelatin, thus making the muscle fibers more accessible to the gastric juice. Cooking renders proteid more insoluble than when raw, but this is counter-balanced by the other advantages of cooking. Very little nutritive value is lost in cooking, especially when the juices extracted are used in the gravy. Raw meat is very distasteful to most people.

As to the time required for cooking meats, it is better to have a long period of cooking and a low temperature than a short time of cooking and a high temperature. But in order to bring out the flavor

of the meat it should have a high temperature at some time during the cooking, either at the beginning or at the end. For the greater part of the time the temperature should be below 100°C . The temperature must not be too low, for in that case the meat will not be sterile. The best temperature is between 90°C and 98°C .

For this long cooking of meat the expense of fuel must be kept in mind. It is not economy to buy a cheap cut of beef requiring long cooking, when a fire is needed for nothing else. Better buy a good steak which can be quickly pan broiled.

But since the invention of fireless cookery, this disadvantage is eliminated. The meat may be cooked for a half hour on the stove, and then set into the box which is packed with asbestos, excelsior, mineral wool, or some substance which is a poor conductor of heat. The meat must be left in the cooker several hours, according to the size of the piece. This has proven satisfactory.

The different methods of cooking meat are broiling, frying, boiling, stewing, baking and roasting. Broiling is done by placing the meat on a wire or iron rack and holding over the coals. Pan broiling is done by cooking the steak in a hot pan, without fat.

In frying, the meat is cooked in a bath of hot fat.

Boiling is the cooking of meat in water. In stewing, the meat is cut into pieces, and the broth is a very desirable part.

Baking is cooking meat by dry heat in covered dish. Roasting is cooking by an open fire without the cover, so that it is in free contact with the air.

An acid, as vinegar, lemon or tomato juice, aids materially in making the beef tender as will be shown in our experiments. The acid assists in changing collagen to the soluble gelatin.

The nutritive value of the meat is about the same in the different methods of cooking. In boiling and stewing, much of the flavor of the meat is lost in the broth, but very little of the nutrients. In pan broiling there is almost no loss.

In order to ascertain the best methods of cooking the cheaper cuts of beef, and to prove that they can be made palatable, we conducted a series of experiments. Before discussing these it might be well to state briefly the method of preparation.

The meat should be washed with a damp cloth. If the meat is to be roasted or boiled, the juices should be sealed in either by searing in a hot pan, or by pouring over it boiling water.

Experiments.

No. I..

a.

Neck, 4 lbs. @.06 ---- .24

Object ---to determine effect of high temperature.

Boiled rapidly for 5 hours.

The meat was very tough and lacked flavor.

b.

Same as a, but was cooked with high oven heat.

The flavor was better, but the meat was tough.

No. II.

Neck, $3\frac{1}{2}$ lbs. @ .06 ----- .2I

Object --- effect of acid.

a.

Seared and then boiled for 30 minutes;
temperature then reduced to 95°C , and
kept for 7 hours.

b.

Same as a, with the addition of $\frac{1}{2}$ cup vinegar.

b was noticeably more tender than a; both
were more tender than those in Ex. I.

The one disadvantage of adding vinegar is that the broth is not so palatable to the average taste.

No. III.

Neck, $3\frac{1}{2}$ lbs. @ .06 ----- .2I

Object --- advantage of the fireless cooker.

Meat was seared, boiled 30 minutes, and put into
cooker where it was left 14 hours.

Temperature on removal was 52°C .

The beef was of good flavor and more tender than Ex. I

No. IV.

Brisket, 2 lbs. @ .06 ----- .I2

Object --- effect of acid used before cooking.

a.

Seared, boiled for 30 minutes, temperature
lowered to 95°C , and cooked 5 hours.

b.

same as a. Soaked in vinegar, salt and pepper for 2 hours, and cooked for 3 hours at same temperature.

b was more tender than a, in spite of shorter length of time of cooking.

No. V.

Rump, 3 lbs. @ .10 --- .30

Object --- result of different amounts of water in fireless cookery.

a.

Seared, cooked in oven with a small amount of water for 30 minutes. Then put in cooker for 12 hours.

Temperature on removal was 42° C.

b.

Same kind of a piece, seared, then almost covered with water. Cooked in oven 30 minutes, and in cooker 12 hours.

Temperature on removal was 47° C.

The flavor of a was better, but the temperature is kept up better with more water.

No. VI.

Shoulder Clod, 3 lbs. @.10 --- .30

Object --- use of tomato juice.

Seared, and cooked in 2 cups of tomato sauce for 1 hour.

Then put in cooker for 13 hours.

Temperature on removal 42° C.

The meat was very tender and of good flavor, the tomato being a valuable addition.

No. VII.

Rib Roast, 4 lbs. @.12 $\frac{1}{2}$ ----- .50

Seared, and roasted in oven 1 hour. No water was added.

Kept in fireless cooker for 13 hours, when the temperature was 40° C.

Although a more expensive cut, this piece was not as tender as Ex. VI. This may have been due to the lack of liquid, or to the absence of acid. The temperature was slightly lower, 40° C.

No. VIII.

Shoulder, 4 $\frac{1}{2}$ lbs. @.08 ----- .35

Object ----- slow oven heat.

Seared and placed in casserole, almost covered with water and set in medium hot oven. Cooked 4 hours.

The meat was very tender and the flavor excellent.

No. IX.

Flank, 3 lbs. @ .06 ---- 18

Flank, Stuffed and Baked.

The piece of meat was spread with a dressing made of bread crumbs, egg, butter, salt, pepper and sage. It was rolled up, tied, and seared, then put in the casserole with $\frac{1}{2}$ cup water.

Baked for $3\frac{1}{2}$ hours.

The meat was more tender than any yet cooked, and the flavor was good.

No. X.

Round steak was prepared in the same way as No. IX.

It was a little better than flank.

No. XI.

Below round, 2 lbs. @ $.08\frac{1}{2}$ ---- .17

Vinegar roast.

Seared the meat to keep in juices. Put in bake pan with $\frac{1}{2}$ cup water and $2\frac{1}{2}$ tablespoons vinegar. Roasted $3\frac{1}{2}$ hours and was perfectly tender. The slight vinegar flavor was not unpleasant.

No. XII.

Shank .15

Poured boiling water over the meat to seal in the juices. Boiled 15 minutes, then the temperature was lowered. Cooked 7 hours, but the meat was not very tender.

This is not a good piece to buy, except for soups, on account of the large amount of waste.

No. XIII.

Round steak, 1lb. .15

A part of the steak was rubbed with lemon juice and olive oil, and allowed to stand over night. The two pieces were then pan broiled, the one rubbed with lemon juice and olive oil being more tender. Both pieces were good. The acid and oil did not detract from the flavor of the meat.

No. XIV.

Neck, 2 lb. @ .06 --- .12

Hamburg steak.

The meat was run through the meat chopper, seasoned, and mixed with one beaten egg. The egg serves to keep in the juices. The mixture was formed into patties and ^{pan} broiled

This is a very good method as the chopper cuts apart the fibers of the meat.

This mixture might have been made into a loaf and baked, then called Hamburg Loaf.

Cutlets.

These were made by dipping small pieces of the meat into beaten egg, then in bread crumbs. Fry in deep fat.

This was very good, but round steak makes better cutlets.

What to do with left-over meats to make them palatable and attractive is a problem in most homes. There are really many ways to use cold beef and have it appetizing. In treating of the economy in the use of meats, we could not very well omit the "left-overs."

We have found the following recipes very good:

Croquettes.

1 C. chopped meat, seasoned.

1 C. white sauce made of 1 C. milk, 2 tbsp. flour, and 2 tbsp. butter.

Blend the meat and white sauce, let cool, and shape into balls or cylinders. Fry in deep fat, drain on paper and serve.

Beef Fritters.

1 C. flour.

$\frac{1}{2}$ C water

2 tbsp. butter

1 egg white

Some cold roast beef, chopped.

Mix flour and water into a smooth batter; add butter and meat seasoned to taste. Then add the stiffly beaten egg white. Drop by spoonfuls into a pan of hot fat. Remove from fat and drain.

Roast Beef Patties.

Cold roast beef chopped and moistened with the broth. Make into patties, roll in flour or bread crumbs, and saute.

Serve with a tomato sauce:

1 C tomato juice

A spk. of salt.

1 tbsp. flour

1 tbsp. butter

Make as for white sauce.

Meat Souffle.

I C milk	2 C cold chopped meat
I tbsp. butter	$\frac{1}{2}$ C stale bread crumbs
I tbsp. flour	Yolks of 3 eggs
I tsp. salt	Whites of 3 eggs,
$\frac{1}{8}$ tsp. pepper	stiffly beaten.

Make a sauce of the first five ingredients, add bread crumbs, and cook two minutes; remove from fire, add yolks of eggs, then fold in the whites.

Turn into a buttered bake dish and bake 35 minutes in a slow oven.

Beef Rissoles.

Make pie crust; cut this in round pieces. Put a tablespoonfull of chopped meat and broth on each; brush edges with egg and lay another round on top. Pinch edges together, brush all with egg, and fry in deep fat.

Pressed Beef.

Pick the fibres of meat apart and lay in a pan; pour over this the broth which has been cooked down. Put a weight on the pan and let stand several hours in a cool place.

Forcemeat Cakes.

2 c stale bread crumbs	$\frac{1}{2}$ tsp pepper
1 c milk	2 tbsp butter
1 tsp salt	1 egg

2 cups meat, chopped.

Cook the milk and stale bread in a double boiler 10 minutes. Remove from the fire and mash with a spoon. Add the butter, meat and seasoning.

Shape into flat cakes, roll in beaten egg and crumbs; fry in deep fat.

Meat pie is made by filling a bake pan with chopped beef and gravy, and covering with a rich biscuit dough or pie crust.

Bake in hot oven.

Meat Chartreuse is made in the same way, using boiled rice as a covering instead of the biscuit dough.

Good salads may be made of veal and celery or cabbage, with a good salad dressing.

Conclusion from these studies.

1. Although the protied of the body may be supplied by other foods, meat is just as economical and more digestible than most others.
2. Cheap meats are as nutritious and can be made as palatable as some of the more expensive cuts.
3. Cooking at a low temperature for a long period is the best method.
4. It is necessary to have a high temperature at some time during the cooking in order to develope flavor.
5. Acid aids materially in making meat tender, and shortens the length of time required for its cookery.

6. Meat can be cooked very satisfactorily by the fireless cooker.
7. It is not necessary to waste left-overs, nor to serve them in unattractive ways.