AN EXAMINATION OF THE MEAT OF POULTRY FATTENED BY THE FRENCH PROCESS.

By Prof. Henry A. Mott, Ph.D., LL.D.

Having had occasion to examine the French Process for the Fattening of Poultry, it occurred to me that the result of my investigation may prove of interest.

By this process chickens, which have been accustomed to run at large and obtain such food as they can find, are placed in separate compartments and secured, the compartments being arranged on a large revolving table, with one tier above the other.

The chickens are fed one at a time by the keeper, who rotates the table, thus bringing the chickens one after another in front of him. A tube having an appropriate nozzle is inserted in the mouth of the chickens and passed into the throat, through which tube a definite amount of food is injected into the chicken's crop (not into the stomach). At first, only a small quantity of food is thus fed to the chickens, but toward the end of three weeks, the time required for the fattening process, the quantity of food is increased.

The food consists of

Buttermilk	30.0	per cent. by *volume.*
Corn meal	25.0	" "
Buckwheat meal	12.5	" "
Barley meal	7.5	" "
Water (sufficient for the right consistency)	25.0	" "
	100.0	per cent.

During the first week, on an average 70.5 c. c. (4.3 cu. in.) of this food is fed three times a day; during the second week 93.4 c. c. (5.7 cu. in.) is fed at a time, and during the third and last week 129 c. c. (7.9 cu. in.) of food is fed three times daily.

The establishment is always kept dark, but perfectly ventilated, the object being to produce whiter meat and prevent restlessness, which would arise if the chickens could observe their surroundings.

After fattening over 250 chickens by this process, I selected three for investigation; I also secured in the market three Philadelphia and three Western chickens. I roasted, broiled and boiled one of each, with the following results:

Class of Chicken.	Weight after being picked.			Weight after being dressed.			Weight after being cooked.		
	Gms.	Lbs.	Oz.	Gms.	Lbs.	Oz.	Gms.	Lbs.	Oz.
For Roasting.									
Western chicken	1577.3	3	8	1247.1	2	12	793.5	1	12
Philadelphia chicken	1360.5	3	0	1020.4	2	4	680.1	1	8
French fattened chicken	1577.2	3	8	1133.7	2	8	680.1	1	8
For Broiling.									
Philadelphia chicken	1024.4	2	4	734.7	1	10	566.8	1	4
French fattened chicken	1133.7	2	8	852.6	1	14	648.5	1	7
For Boiling.									
Western chicken	1360.5	3	0	1020.4	2	4	734.7	1	10
Philadelphia chicken	1473.8	3	4	1020.4	2	4	793.5	1	12
French fattened chicken	1587.1	3	8	1133.7	2	8	793.5	1	12

Class of Chicken.	Loss of weight in cooking.	Total loss in weight.	Percentage of water in cooked breast.
For Roasting.			
Western chicken	36.37%	50.0%	57.57%
Philadelphia chicken	30.56%	50.0%	64.57%
French fattened chicken	40.00%	57.15%	64.18%
For Broiling.			
Philadelphia chicken	23.08%	44.45%	-- --
French fattened chicken	23.34%	42.50%	-- --
For Boiling.			
Western chicken	27.78%	45.84%	64.96%
Philadelphia chicken	22.23%	44.04%	53.84%
French fattened chicken	30.00%	50.0%	66.66%

The breast of the Western chicken when cooked was yellowish-white, tough, fibrous and stringy and difficult to masticate.

The breast of the Philadelphia chicken was cream-white, tender, but stringy, at the same time was easily masticated.

The breast of the French fattened chicken was pure white, homogeneous, not fibrous or stringy; very mellow, exceptionably tender, of fine delicate flavor and masticated without effort.

The meat on the second joint of the French fattened chicken was not so dark as the meat on the similar joint of the Western or Philadelphia chicken. It was found to be more juicy, possessed of more delicate flavor, and was more readily digested than either of the others.

The percentage of fat in relation to the nitrogenous matter is less in the meat of poultry than in the meat from mammals, and hence chicken meat is not quite as readily digested. The blood also differs considerably, but as chicken meat contains three times as much phosphates as the flesh of mammals, and as phosphates contribute to the regeneration of the nervous system, it is superior in this particular.

The ratio in which the nitrogen in food should exist as regards the carbon is as 1 to 16. There will then be generated by the oxidation of the carbon sufficient heat to maintain the normal temperature of the body during the time required for the digestion of the nitrogen-containing food.

If we call the meat of the chicken (less the fat) the nitrogen-containing food, then the more nearly the percentage of fat (represented by carbon) approaches the required ratio, the better will the normal temperature of the body be maintained during the process of digestion and the more easily will the meat be digested. If the breast of the chicken, devoid of fat, was eaten alone, whilst it would digest in time, the temperature of the body would be reduced and, if continued *exclusively*, would in a short time produce starvation and death. Just as the proportion of fat to the meat approaches the desired ratio, in the same proportion does it approach a more perfect food.

It becomes necessary therefore to know the percentage of fat the meat of the chicken contains in each case, and I have made the following analysis to determine this factor.

The breast of a Western, Philadelphia and French fattened chicken was taken before being cooked and submitted to analysis. As the raw meat is covered with a skin attached to which is the layer of fat, which on cooking permeates to a greater or less extent the meat, and is to some extent retained next to the meat and eaten with the same, this layer was detached and analyzed.

From the Western Chicken,.....3.01% of Fat was obtained.

" Philadelphia Chicken, 10.7% " "

" French fattened " 64.76% " "

The difference in these results speak for themselves. It may, however, be well to remark that the French fattened chicken is enveloped by a layer of rich fat, which on partially melting in the process of cooking, permeates the meat, thus enhancing its value and at the same time furnishing a rich gravy, as the loss in weight in the first table clearly demonstrates.

It is a well established fact that exercise is unfavorable to fatty deposits; chickens that are allowed to run about do not become fat to the same extent as those confined at rest.

The distinguished English physician, Dr. Pavy, says: "The fattening of poultry for the table forms in some parts of the country an extensive branch of industry, and the improvements that are effected in the quality, equally as regards tenderness and flavor as size of the bird is exceedingly striking."

The art, therefore, of fattening chickens consists in keeping them at rest, and feeding them with an abundance of easily digestible and appropriate fattening food, and subjecting them to this process for about three weeks before killing them for edible purposes. Experiment has shown that if the chickens are kept four or five weeks they become feverish and sickly, but if the time does not exceed three weeks, the desired result is obtained.

As the best food, care and attention is given to chickens when being fattened by the French process, it is no wonder that the flesh of such chickens, when cooked, is more tender, of more delicate flavor and more easily digested than the cooked flesh of chickens not so fed.

It is thought by some that the artificial feeding of chickens by the French process is identical with the process employed to obtain "*foie gras*" in the goose. This is an error, for in the case of the goose the process as given by Dr. Pavy is as follows: "Morning and evening, maize or Indian corn previously soaked in water, is crammed down the bird's throat to repletion; during the day it 'drinks and guzzles in the water before it,' which con-

tains fragments of charcoal and salt. The liver of the goose is by this process increased in weight up to one to two pounds."

In the case of the French process for fattening chickens, the food given is *ground* meal, etc., mixed with the right proportion of milk and water, so as to facilitate digestion. In consequence of which, the chickens increase nearly forty per cent. in weight, the fat and meat being uniformly distributed over the body, and the liver not being enlarged *at all* as in the case of the goose.

SOME LECTURE EXPERIMENTS.

By A. A. Breneman.

1. The dissociation of soap by water.

A well filtered alcoholic solution of soap containing a little phenolphthalein is poured carefully into a glass cylinder half filled with distilled water, which also contains phenolphthalein. The line of contact of the liquid is colored bright red, and, on carefully stirring with a long rod, a pink flush is diffused through the mixed liquids. As both are free from color before contact the liberation of alkali by the water is plainly shown, and the theory of the action of soap is thus illustrated. The alcohol may be of fifty to eighty per cent., and should contain a large quantity of soap in solution. The cylinder is tilted at forty-five degrees in pouring in the soap solution so that the layers of liquid may be distinct.

2. Dissociation of ammonium chloride by heat.

The following experiment is easily performed and requires much less apparatus than such as require the separation of the dissociated constituents by diffusion through a porous cylinder. It depends simply upon the greater solubility of ammonia gas in water as compared with gaseous hydrochloric acid.

Into a long necked, round bottomed Bohemian flask is put three to five grms. solid NH_4Cl, and the flask is heated over a gas lamp (best a triple burner), until the solid has nearly disappeared and the bulb of the flask is filled with transparent gas.