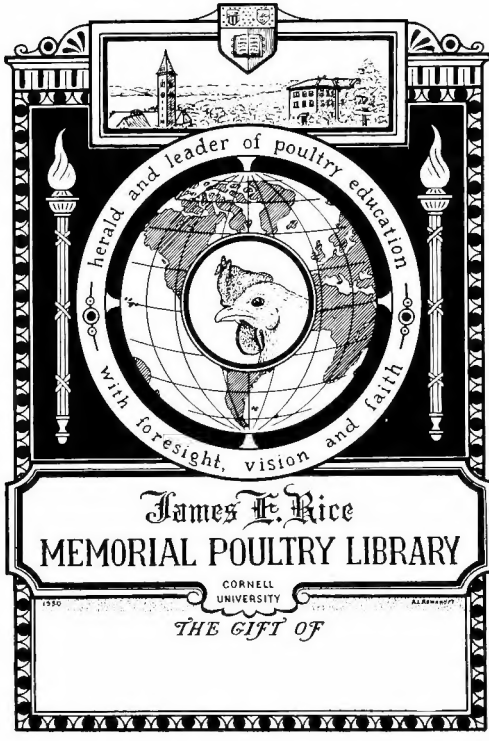
POULTRY FEEDING AND FATTENING

GEORGE B. FISKE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PARTIAL VIEW OF A MODERN AMERICAN DUCK FARM

Poultry Feeding *and* Fattening

INCLUDING PREPARATION FOR MARKET, SPECIAL FINISHING METHODS, AS PRACTICED BY AMERICAN AND FOREIGN EXPERTS, HANDLING BROILERS, CAPONS, WATERFOWL, ETC.

Fully Illustrated

Compiled by GEORGE B. FISKE
Author of Poultry Architecture, Poultry Appliances, Etc.

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INTRODUCTION

THE weak point in general poultry books has been the scant attention given to the subject of the standard and improved methods of feeding and marketing. The result is that the practical knowledge of these branches of poultry keeping has lagged behind the others.

Of all live stock, poultry is most often misfed, overfed or underfed. Conditions are artificial, the individuals fed are numerous and their needs not uniform. Most important of all is the need of the same careful rules and experience which guide feeders of cattle, sheep or hogs. It is only in recent years that much attention has been devoted to special study of poultry to make possible a collection of reliable information on the subject. Given good stock, good feeding is the key to success.

The subject is approached largely from the side of the best practice and experience, although the underlying science of feeding has been explained as fully as needful. In the absence of digestion tables applied to fowls and of a sufficient number of feeding trials, the science of feeding poultry has not yet reached a point where the so-called scientific ration can be compounded without large reference to the actual experience of successful feeders.

The subject has been made to cover all branches, including chickens, broilers, capons, turkeys, waterfowl: how to feed under various conditions and for different purposes. The whole subject of capons and caponizing

is treated in detail. The chapters on fattening and preparing for market are intended to be very complete on a subject scantily covered in other books.

Few realize how much room exists for improvement in the line of feeding and fattening for market. The best foreign methods have already gained a foothold in America and the resulting product was an immediate success in the market. The feeding machine, shaping board and other special appliances will soon be in more common use by those who travel with the van of poultry progress.

American meat buyers are the most lavish in the world. Having once learned the taste of the best poultry, not that which is thin and scrawny or has been covered with grease in the so-called fattening process, but fowls made to take on more flesh, softened and ripened, then carefully dressed, fitted and shaped for market by all the various arts that can make good poultry attractive to the eye; after once sampling such poultry the liberal, well-to-do buyer will be content with nothing inferior. In fact, with the well-known high standard of the American food buying public, it is hard to explain why the perfecting of poultry meat has failed to keep pace with that of similar products.

With the instruction given in this volume there is no reason why the intelligent poultryman should not learn after due experience to breed successfully and also turn out a product as good as the best, and suitable for the most fastidious trade.

CHAPTER I

THRIFTY GROWTH

CHICK feeding is sometimes a very simple matter. If they are strong stock, hatched in the most favorable season and given wide range, they require but little more care in feeding than mature poultry. The writer has raised thousands under such conditions on a diet largely composed of ground grain mixed raw with skimmilk and fed three times a day from shell to market. Yet no question but care, frequency, variety and adaptation in feeding chicks always pays, and is in fact necessary for cold weather chicks, those of feeble stock and those kept in close quarters. There is no profit in a chicken kept just alive. The faster the growth the greater the profit, whether grown for market or for winter laying.

One reason why more care should be taken in feeding chickens than the older birds is that the former know less what they want than the latter. They are hungry things, and take whatever is given them, and their digestive organs being weak, they are not as able to dispose of anything objectionable as are older fowls.

Far too much corn meal is fed to chicks, and it is to that cause, in a great measure, that there are so many young chicks which die early—often before they have fully feathered out. Like very young stock of any kind, they require something nourishing, though not violent or heating, to induce them to make a good and healthy growth.

To get most rapid growth they should be fed early in the morning, and as late as they can see to eat at night. In the intervening time they should be fed not

less than four times. Feed a little at a time but often, is a good rule to follow. It is not a bad plan to give three meals of soft feed and three of dry. In order to feed with economy, it is necessary to have slat feeding coops, so made as to admit the chicks and to exclude the mother hens and other fowls. These coops may be quickly and cheaply made by tacking plastering lath on strips of inch stuff. The food may be placed in these coops on long boards or shallow troughs. No more soft food should be given at one time than will be eaten up clean. The habit that some have of throwing out a great mass of soft food—sufficient to last a day—to become foul and sour, is very wasteful and injurious to the chicks.

Do not lose sight of the importance of a balanced ration for the young, growing chickens. Bulletin 61 of the Rhode Island experiment station shows the danger that comes from feeding too much grain. The best results were obtained by feeding an abundance of animal protein, of which milk is the best form. Disease and death followed the excessive use of starchy foods. Green food cannot safely be omitted.

To push young chicks along and keep them in health, there is nothing better than boiled eggs mashed up, shells and all, with two or three times their bulk of stale bread crumbs, or cracker crumbs, thoroughly mixed. Mix not more than enough for one feed of this at a time and give them only what they will eat readily and quickly. Feed stale bread soaked in milk, either whole, skimmed, or buttermilk after the milk has been squeezed out by hand.

This is not a very expensive method of feeding, as the chicks, being so small, will not consume much of it daily, while the very best results have invariably followed such a system of feeding and management. But if milk is not obtainable, use the yolks of tested

out eggs, either raw or hard-boiled or soft-boiled, as convenient, mixed with the bread crumbs, for the first fortnight.

Only one day's feed should be prepared at a time, as it will sour if left to stand any length of time. Millet seed scattered in the litter about the brood house or the short grass; plump wheat screenings; oats and corn ground together, with an equal quantity of bran, and made into johnnycakes—are good for the youngsters. After they get to be three weeks old cracked corn and whole wheat may form a larger part of their diet, increasing it as they grow older. Better results are attained by a judicious alternation of all, day by day, or feed by feed; it keeps the appetite sharp and they are always on the lookout for the new surprise at meal time. Don't forget the pure clean water, they need that whatever the feed. If the soil does not supply grit in proper shape and size it should be furnished them; a dish of charcoal where they can help themselves, or a handful in the soft feed four or five times a week, will prevent most of the ordinary bowel troubles. No tonic or stimulant should be needed at this age, but if a brood gets suddenly chilled, a dose of some good condition powder will help to put them on their feet again.

EXPERIENCE IN FEEDING YOUNG CHICKS

I feed the young chicks the first few days on bread soaked in milk, then cracked corn and wheat.—[F. W. Trask, Lincoln County, Me.

For feeding little chicks I use millet seed and find it superior to any feed I ever tried. Chicks will do well on this seed for at least three weeks and grow faster than on anything I have ever tried.—[J. M. Buckles, Logan County, Ill.

The first ten days I fed them on bread crumbs, after dipping the bread in milk to moisten it. After

that I feed them on coarse corn meal moistened, but not very wet, until they are old enough to eat cracked grain. All the time they have plenty of fresh water to drink.—[Mrs. L. I. Clark, Erie County, N. Y.

My method of raising chickens is to feed them any and all kinds of grain and vegetables. I give oats to make bone, wheat for feathers, corn, buckwheat and green foods to fatten.—[D. C. Wells, Indiana County, Pa.

I never feed the chicks until they are twenty-four hours old, and I sometimes think that is too soon. The first feed is dry rolled oats and bread crumbs. Then I feed mostly corn chop. I never feed warm mashes to the chicks or old hens. The laying hens I feed oats and screenings in the morning, screenings for dinner and corn at night, with plenty of good water and exercise.—[F. W. Silloway, Macoupin County, Ill.

I usually feed three times a day, morning, noon and night. Never throw feed on the ground or in dishes where it will be likely to be contaminated with droppings from the hens or other filth. I keep constantly within their reach clean water in pans, changing it every morning and rinsing out the pans. About 4 p. m. I give them a feed of wheat, cracked corn or both.—[J. J. Parker, Chautauqua County, N. Y.

The chicks are placed in a brooder warmed to ninety degrees, the floor of which is covered with dry, sharp sand. I sift some corn and oat chop and mix with sour milk, soda and salt, and bake johnnycake for them. The inner part is crumbled into shallow pans and onto clean paper. The crust is moistened with sweet milk warmed and fed in pans. The chicks are fed every two hours. When chicks are four days old, they are allowed to run in a covered yard 4x8 feet, built around the brooder. When two weeks old, they are allowed to run at liberty but are always fed in the brooder yard. As they grow

older, they are not fed so often, and at a month old, five feeds a day is sufficient. At each feeding, fresh, clean water is given.—[Mrs. C. G. Ford, Charles City County, Va.

After the chicks are twenty-four hours old I begin to feed crushed wheat and some grit. When four or five days old they get some cake made from middlings and corn meal. At five or six weeks I give a little animal meal or scraps. I keep fresh water constantly before them in small earthenware fountains. I also use a cake made from American poultry food and one-fourth corn meal. In addition to the above I give them the lawn clippings and waste fruit. They are fed five or six times a day.—[John M. Harrington, Middlesex County, Mass.

Our three favorite articles of diet for chicks are bread crumbs, millet seed and oatmeal, and of the two latter commodities we buy in quantities expressly for the season's work in the poultry world part of the farm. Millet seed at thirty cents per bushel becomes an inexpensive part of their living; ten bushels or more of this seed is yearly put safely away for this purpose, for the young broods as they come from nests and incubators. Oatmeal is purchased by the barrel, lessening the expense very materially as compared with the price of it when bought by the pound or "quarter's worth." Rolled oats we have come to look upon with suspicion, as we have noted occasional bad results from feeding it. It becomes pasty in the crop if a meal is made of it exclusively, and thus becomes to an extent indigestible. We now use the steel cut oatmeal, or what is sometimes designated "the pinhead oatmeal." It is clean, sharp cut, free from flour and much relished by the chicks and they thrive amazingly upon it. The barrel of oatmeal just purchased, 200 pounds, cost $1.50. This will doubtless be more than sufficient for the season, fed,

as it is, with other kinds of food.—[Nellie Hawks, Kansas.

Best Developing Ration—For developing thoroughbred fowls as well as for laying hens, I. K. Felch recommends the following ration where the grains can be procured at reasonable prices: Five pounds beans, ten pounds each wheat bran and barley, and fifteen pounds each oats and corn. These are thoroughly mixed and ground fine. For the morning meal take four parts of this and one part ground beef and scald over night.

Expert Duck Raising—The following summary is prepared by G. H. Pollard, an extensive and prominent poultryman of Bristol county, Mass.: Start the ducklings on a feed of two-thirds bran and one-third Indian meal. If we have milk, I mix it with that. Give them drinking water from the first. We start them on that food with just a handful of gravel or sand thrown in for two or three days. After that they are supposed to know enough to eat grit if they want it. We mix the food cold as a rule. If we had very early birds we would mix it with warm water and would slightly warm the drinking water. I never cook the food. As a rule it seems to me that it makes more labor with no corresponding gain in produce. The only question in making a good thing of the business is in keeping the labor down. You cannot cut down the amount of their food, but you can make a saving in the amount of labor.

We start the young ducks on the above-mentioned food and carry them along until about the fifth day and then begin to add beef scrap. When we begin to add this food we gradually take away the milk and give it to the younger ones which come along. In an ordinary mash you cannot get enough animal food from the milk used to mix it, so we use beef scrap to make up for it. We rarely give milk to ducklings or even

to chicks to drink because they get it all over themselves, which makes them anything but pretty birds. We prefer to give it in soft food. We begin to add about five per cent beef scrap on the fifth day and from that we gradually increase the beef supply until at two weeks they should be getting about ten per cent. If they do not seem to be thriving we take away most of the beef and give them grain almost altogether.

Of late our tendency has been to feed more bran. We never exceed the proportion of half meal and half bran. Some breeders give at the end of ten weeks eighty per cent of meal, but we like bran better. Ducks and geese detect a very slight change in food and at any abrupt change they will refuse to eat. I think ducks are even more particular than geese. The theory with hens is that they should have as constant change of food as it is possible to give them, but this theory will not work on ducks.

We carry them right straight through on this feed, not exceeding one-half bran and one-half meal, and some beef scrap. One can mature birds more quickly by giving more beef scrap. Of course it is a question whether one can afford to pay so much for beef scrap when one could get the same results with bran in a little longer time. One can get fairly good results with nothing but bran and meal.

If raising for breeding birds, you can mature them and get as good a frame on bran and meal, but it will take two months longer. A bird hatched in March would be pretty well developed in September if fed stimulating food, but it would be November before it was developed if fed no stimulants. We believe in an abundance of green food for breeding birds. In all waterfowls the white-meated ones are the desirable birds. A large proportion of bran will give a white-meated bird either in ducks or fowls.

For Feeding Ducks, rules vary. One large eastern grower allows 400 quarts of mixed feed per day at two feeds per day for 600 breeding and laying ducks. This is at the rate of about two-thirds of a quart per day for each duck. Comparing this with the ration for hens, it will be seen that the appetite of the duck is much larger than that of the hen.

Experiments in Feeding Ducks—The feeding and management of poultry has been studied by a number of the stations. In most cases the work has been confined to chickens. Two of the stations have reported experiments with ducks, summarized as follows by C. F. Langworthy:

The Michigan station studied the comparative growth made by thirty-nine young ducks and the same number of chickens on similar rations. The ducks were two weeks old at the beginning of the test and were fed middlings, corn and bran, together with the necessary grit and green food (lettuce), and were given the run of a small yard with a grass patch. The chickens were fed bran and relatively more corn meal than the ducks, but had no middlings. They were also given lettuce and allowed the run of a grass plat. Both chickens and ducks were given skimmilk in addition to the other food. At the beginning of the test the ducks weighed 13.25 pounds and the chickens 7.5 pounds. In five weeks the ducks were nearly ready for the early market and had gained 108.75 pounds. They had eaten 41.3 pounds of corn, 93.1 pounds of middlings, 43.4 pounds of bran, fifty-nine pounds of lettuce and eighty-eight pounds of skimmilk. The total cost of a pound of gain was 1.9 cents. In the same period the chickens had gained thirty pounds and had consumed 52.2 pounds of corn, 25.9 pounds of bran, forty-six pounds of lettuce and 44.3 pounds of skimmilk. The total cost of a pound of gain was 4.84 cents. In discussing the

profits corn and bran are rated at $14 and middlings at $15 per ton, milk at twenty cents per hundred, and lettuce at one cent per pound. The ducks gained much more rapidly than the chickens and the gains were more economically made. The chickens were not large enough for market at the close of the test and the feeding was continued for some time before they were sold.

At the North Carolina station eighteen Pekin ducks were fed for fifty-six days from the time they were hatched. At the beginning of the test the total food consisted of 4.4 ounces of corn meal and an equal amount of bran per head daily, while at the close of the test, six pounds ten ounces of meal, four pounds three ounces of bran and three pounds five ounces of bone were fed daily. In addition to the grain an amount of fine grit equal to one-sixth of the weight of the grain, and chopped green clover equal to one-fourth the bulk of the ration, were also fed. All the feed was mixed with water to a crumbly mass and fed in troughs. No water was allowed except for drinking purposes. In this test corn meal, cut bone and grit were each rated at one cent per pound and wheat bran at 0.9 cent per pound. Account was also taken of the value of the clover fed, the eggs set, and the food of hens carrying the ducks. The ducks weighed two ounces when hatched, and four pounds fifteen and one-half ounces at the close of the test. The cost of a pound of gain was 5.05 cents.

What to Feed Young Turkeys, as told by E. D. Weswer of South Dakota, whose methods have been awarded a prize in a recent contest: After the eggs are all hatched and the young turks are taken off and placed in their house and yard, give them their first meal, which should be stale bread crumbs soaked in milk, and hard-boiled eggs. Boil an egg five minutes and it will be tough and indigestible, but boil it half

an hour and it will be easily crumbled. When four or five days old begin feeding curds, and give all the sour milk they will drink. Chop onion tops and lettuce and give with the food until they begin picking young and tender grass. Twice or three times a week give a little pepper in the food. Don't give too much—their mouths are not lined with sheet iron—but season as if you expected to eat it yourself.

By the third week, begin feeding cooked corn meal. Do not give a full feed of meal at first, but add a little more each day, until at four or five weeks they are to be fed entirely on cooked corn meal, with all the sour milk they will drink. Never feed any raw meal to young turkeys. It should always be cooked by baking, until the turkeys are two and one-half months old. Feeding meal too soon, feeding uncooked meal and feeding grain before they are able to digest it will kill fully one-half of the brood.

When six or eight weeks old, feed cracked corn or wheat screenings at night. From the time when you begin feeding until they are fully feathered and have thrown out the red on their heads, feed five or six times a day; then if insects are plenty they will thrive on two meals a day, cooked corn meal and potatoes in the morning and cracked corn or other grain at night.

Should a sudden shower come up while the young turkeys are out foraging, drive them to their coops. If any get chilled and refuse to eat, take them to the house, dry and warm them thoroughly, return to the mother and give a good feed with plenty of red pepper or ginger mixed in. Where insect forage is abundant, turkeys will pick the greater part of their living for three or four months and in such localities it will do to turn them out after they are three months old without any breakfast, but they should always have a handful of grain at night.

CHAPTER II

EXPERT CHICKEN FEEDING

BY A. F. HUNTER

THE first rule for getting a good profit from poultry is to hatch the chickens early. Equally important is the second—keep them growing so that they will come to laying maturity by November 1. The food and care has much to do with keeping the chicks growing.

Let them alone until they are twenty-four hours old, or until the morning of the twenty-second day. They need no food during this time; nature has provided for that by absorption of the egg yolk into their little abdomens, and it is necessary that this egg yolk be digested and assimilated before any other food goes in. Much damage is done and many chicks killed by not observing this rule. Some people in their feverish haste to get the chicks growing, hurry food into their crops before the system has been toned up to take care of it. The consequence is the bowels are congested, dysentery sets in, and the chick goes over to the majority.

We always set the hens in pairs, so the chicks of two hens may be given to one, allowing the other to reset. When a brood is to come off we take a covered basket to the nest, remove all the chicks from one hen and put them in the basket, then take the basket and biddy to a coop previously made ready in a sunny, grassy spot. Putting the hen down in the coop, the basket is tipped upon its side near her and the downy little things run out to her protection.

An egg has been previously boiled hard, chopped fine, shell and all, and mixed with double the quantity

of bread crumbs. This is set before them for their first meal. To be sure, biddy gobbles about all of it. No matter. She has worked hard, half starving herself to bring forth this promising little flock, and a good feed now will help to make her contented and happy, consequently a better mother.

Feed a little and often is the best method; every two hours, say five times a day, till the chicks are five weeks old. See that no food is left in the sun to sour after they have eaten; remove it all. Nothing causes more bowel looseness and dysentery than sour food.

Our chief foods for the first five or six weeks are coarsest oatmeal slightly moistened with sweet milk, and waste bread from hotels and restaurants. This bread consists of bread, rolls, tea and corn cakes, etc., and is an excellent food for chickens. We spread it on the attic floor to dry, and then grind it to coarse crumbs in our bone mill. The first feed in the morning is bread crumbs slightly moistened with milk or water; the second, about nine o'clock, is oatmeal moistened as above; about eleven, bread crumbs again, about half-past one, oatmeal, and about four o'clock a little cracked wheat or cracked corn.

There has been much dispute as to how soon dry grain or cracked grain should be fed to chicks. An article upon chicken feeding, by Mr. W. Vale, in Feathered World (London), says: "The chick cannot be too soon supplied with food that will require the grinding power of the gizzard to be properly brought into action. Soft food will not do this, consequently more or less dry food must be supplied. In the gizzard with the aid of some grit, the woody fiber enveloping the most nutritious parts of seeds and grain is ground into atoms, also the nutritious parts thus prepared for digestion and assimilation. Some gritty substance is absolutely essential; for, without it, the gizzard cannot

properly perform its work. Even baby chicks should be fed upon a sanded floor. The gritty matter should be as hard and sharp as possible, so that it will grind up bones and such like substance. When chicks are young, broken wheat, coarse oatmeal, canary seed and hemp seed are each suitable. They should not have much, if any, Indian corn, as it makes them too fat, and thus renders them liable to a variety of ailments. For stock purposes a fat fowl is worse than useless, for its progeny is almost certain to be weak."

Green food must be supplied. If the chicks are cooped upon fresh grass the problem is solved and they will help themselves to what they need. If, however, they are confined in small yards, finely cut grass, as from the lawn mower, onion tops chopped fine, lettuce leaves, or even boiled vegetables, will make a good substitute. The grass run is *the* thing if possible, and substitutes are only suggested where the grass run is unobtainable.

Fresh, cool water is kept constantly accessible and a drink can be taken when wanted.

Grit is another necessity. Don't think the chicks can find this themselves. That is one of the commonest mistakes in rearing chicks. Have a little dish of grit, or fine gravel, or coarse sand, or broken oyster shells, or broken crockery, or pounded bricks, or even fine clinkers from coal ashes, such as will pass through a quarter-inch mesh sieve, but won't pass through an eighth-inch mesh sieve; all these are good, and one of them at least is get-at-able.

For the benefit of those who cannot get waste bread we give Mr. I. K. Felch's rule for his excelsior meal bread: "Grind into a fine meal in the following proportions: twenty pounds corn, fifteen pounds oats, ten pounds barley, ten pounds wheat bran. We make the cake by taking one quart of sour milk or buttermilk,

adding a little salt and molasses, one quart of water in which a large heaping teaspoonful of saleratus has been dissolved, then thicken all with the excelsior meal to a little thicker batter than your wife does for corn cakes. Bake in shallow pans till thoroughly cooked. We believe a well-appointed kitchen and brick oven pays, and in the baking of this food enough for a week can be cooked at a time."

Wright's "Practical Poultry Keeper" says: "With regard to feeding, if the question be asked what is the best food for chickens, irrespective of price, the answer must decidedly be oatmeal. After the first meal of bread crumbs and egg, no food is equal to it, if coarsely ground and only moistened so much as to remain crumbly. The price of oatmeal is, however, so high as to forbid its use in general, except for valuable breeds; but we should still advise it for the first week in order to lay a good foundation."

We are obliged to differ with Mr. Wright as to oatmeal being an expensive food for chicks. It certainly looks expensive to pay six dollars a barrel (three cents a pound) for oatmeal for chicken food, but it spends so well, goes so far, that we have found it an economical food. We used fifty dollars' worth last year, practically ten cents per chick raised, and it made two-fifths of their food from shell to laying maturity. Considered simply as a food ration, it is economical, but when we consider that "good foundation" which it makes, it becomes even more desirable. A good foundation in the chick means eggs in the basket the next fall and winter; hence oatmeal is a cheap food, in the best sense of the term.

For the first six weeks I feed five times a day, or about once in two and one-half hours, and after the chicks are six weeks old I feed four times a day.

The breakfast is bread crumbs, continued until they are about ten weeks old, when they are graduated into the morning mash such as we feed to our fowls. About ten o'clock they have a feed of the coarsest oatmeal moistened; about half-past one o'clock a light feed of cracked wheat or cracked barley (the latter is a by-product of a cereal manufactory, and an excellent food), and about five o'clock, whole wheat or cracked corn, one one day, the other the next. Twice a week we have fresh meat (butchers' trimmings), cooked and chopped, which is mixed in with the coarsest oatmeal (about half and half) for the second feed. We have, also, a bone cutter, and twice or three times a week the chicks have a good time wrestling and tumbling over each other in their eagerness to get the fresh cut bone.

Not having a bone cutter, we should mix some bone meal into the moistened bread crumbs for breakfast, and about three times a week we sprinkle in a little condition powder as a condiment to promote digestion and good health. We intend to vary the food ration continually within the range here described. For instance, one day the food will be bread crumbs, oatmeal, cracked wheat, cracked corn; the next day, bread crumbs, oatmeal and chopped meat, cracked barley, whole wheat; the next day, bread crumbs, cut bone, oatmeal, cracked corn and so on.

The rule is to feed only what the chicks will eat up clean and quickly; but we break over the rule so far as the last feed is concerned, and the boy goes around a second time, twenty to thirty minutes after feeding, and if it is all eaten up clean, three or four handfuls more are put down, so that all shall have a chance to "fill up" for the night. If a handful is left uneaten it quickly disappears in the morning, and as it is always dry grain, it does not sour, and there is no danger from leaving a little. Grit, in the shape of screened gravel,

is also always by them, and ground oyster shells are given them about twice a week. As there are no trees in our fields we provide a temporary shelter for shade, making a slanting roof near each coop. This helps each family to identify its own home, and, besides, shelter from the hot sun is shelter from the rain also, and the feed boards are put under it in wet weather. With this liberal feeding of a varied food ration the pullets will begin to lay in October and the fowls are then turned off to the butcher, the houses cleaned up and whitewashed and the pullets moved in.

CHAPTER III

BROILER RAISING

THIS industry requires both skill and capital. A successful broiler plant should be run in connection with an egg farm, so that the eggs may be supplied from the home yard. In winter time purchased eggs often either get chilled or are infertile. The second requisite to success is a good incubator. Hens cannot do the hatching during cold weather. The incubator must be so constructed that it will furnish a uniform temperature throughout. The heat should never fall below 101 degrees nor go above 103.

The brooder is important after the chickens have been hatched. A brooder must be so constructed that it is always a little warmer in the center than in other portions. The temperature should be kept close up to 100 degrees for two or three days. After that ninety-five degrees is about right for the remainder of the first week, after which reduce the temperature five degrees each week until seventy degrees is reached.

An even temperature seems the key to raising healthy winter chicks. Visiting the Rhode Island poultry school in 1901, the writer saw 600 in a room fifteen by twenty-eight feet heated by steam pipes and radiators to a uniform temperature of about seventy-two degrees day and night, except for the first few days of the chickens' life, when the temperature was eighty-five to ninety. They were kept in small flocks in brooder boxes and fed as usual. Although the chickens never breathed outdoor air from hatching to the time when at eight or ten weeks of age they were marketed as broilers, they seemed very strong, active and thrifty, and not over fifteen per cent were lost or proved defect-

ive from any cause; a fine showing for January chicks. Some of these chicks were raised to maturity and proved equal to the average to all appearances, although the first ten or twelve weeks of their lives had been passed wholly in the room mentioned.

At the same time this experiment was going on other chickens hatched and fed in the same way as these just described were being reared in brooders heated separately by lamps in the usual manner, and about one-half of them died from lung and other diseases before reaching the broiler size. The manager of the warm room experiment, Dr. Cooper Curtice, writes as follows describing the feeding:

"Many people have asked, on seeing the healthy-growing, well-feathered young chicks, what food we were using. The winter's experience, in which a variety of grains were used, indicates that it is not so much what the food is as how the food is supplied, providing there are plenty of starchy, albuminous and green matters. In nature, small seeds, insects and grass furnish food for chickens. These are most abundant in the spring and summer months, and it is at this time that the chickens thrive. To secure the best results, foods simulating both the composition and the mechanical character of these should be supplied. For instance, in the summer the tips of grasses are young and tender and easily broken by the chickens. For green stuff to be easily assimilable, some plant should be supplied which may also be easily broken. We have found hanging a head of lettuce in the brooder by a string to exactly furnish the desired want and be greedily, even crazily, eaten by the chickens. We have found that sifting the cracked corn, scraps and cracked wheat through sieves, so as to remove both the meal and larger pieces, gives favorable results. Millet seeds, broken rice, rolled oats, and other things of this character were

greedily eaten and well digested. For meat for the youngest chickens, we have given the sterile eggs boiled hard and ground through a sausage machine. While it is preferable, if one has time, to chop the egg fine and mix it with bran, or even feed it a little at a time to the chickens, we found it satisfactory to mix it with the bran until it was crumbly and feed it in bulk; a sufficient quantity being given for the number of chickens in the brooder. Mixing the eggs with cracker did not succeed with us as well for very young chicks, although it is fed by others apparently without harm. As the chickens grew older meat scraps were substituted. These were usually sifted, added to the grain ration, and strewn upon the floor of the brooder. Boiled liver and animal meal were also used, but there was very little difference in the gain of the different chickens when fed upon the animal meal, meat scraps or egg.

"One mixture of seeds was made as follows, at the suggestion of the poultryman: For chicks from one day to six weeks old: Mix four parts cracked oats, one of fine cracked wheat, two of rolled oats, one-half of millet seed, one-half of broken rice, and two of fine scraps. For the first two weeks we have added one pint of millet seed, leaving out scraps during the first week. Boiled eggs, three for each fifty chicks, have also been fed. After six weeks, and up to ten weeks, feed the following mixture: Mix four parts cracked corn, two of fine cracked corn, one of rolled oats, one-half of millet, one-half of broken rice, one of grit, and two of scraps.

"For chicks kept in the colony system give for grain, three parts wheat and four of cracked corn. Also give the following mash three times per week and daily after ten weeks: Mix one part ground corn, one of ground oats, and one of brown shorts. To feed the meat scraps we made the seed-feed into a mash with boiling

water, mixed the scraps with it and covered the mass until it was well steamed. This mash seems to hasten the growth of the chicks. While it seemed necessary to feed the youngest chicks rather oftener, those ten days old were fed mash in the morning, green food at noon, and dry seeds at night, allowing them to fill their crops. When fed oftener they seemed to get satiated and had no desire to eat."

An illustration, Figure 1, shows the poultry superintendent and some of the students feeding these chickens. The grain being thrown on very coarse gravel provides a great deal of heavy scratching for the chicks without causing much dust or dirt. An illustration, Figure 2, shows several of these winter broilers as prepared for market.

It is, of course, not practicable for many broiler raisers to use a warm room in the house as just described, but some attention to the brooder rooms in the line of tightness and warmth will tend toward the same good results.

For later broiler chickens, which include the majority grown, the weather changes are less severe, and the birds will do better if got outdoors as soon after hatching as the weather permits.

Growing Small Broilers—Poultry specialties are becoming still further specialized. Most of the large growers have some special sub-branch to which they devote more attention and from which they get the greater part of their profit.

At Owls Nest Farm in Middlesex county, Mass., the specialty is the growing of small broilers, which are sold at a weight of about three-fourths pound dressed. Chickens of this size are from five to eight weeks old, smaller than pigeons, and to the average farmer would look too insignificant for any use, but the swell clubs

Fig. 1—FEEDING BROODER CHICKS

and high-class hotels in Boston are glad to pay seventy-five cents for them in winter and spring. (See Figure 2.)

Owls Nest Farm has been run for several years and has built up a large trade of the above description; 285 of these small broilers are sold from January 1 to January 20, mostly to clubs and high-class private trade in Boston. This branch of the business is continued the year round, although prices grow lower in the

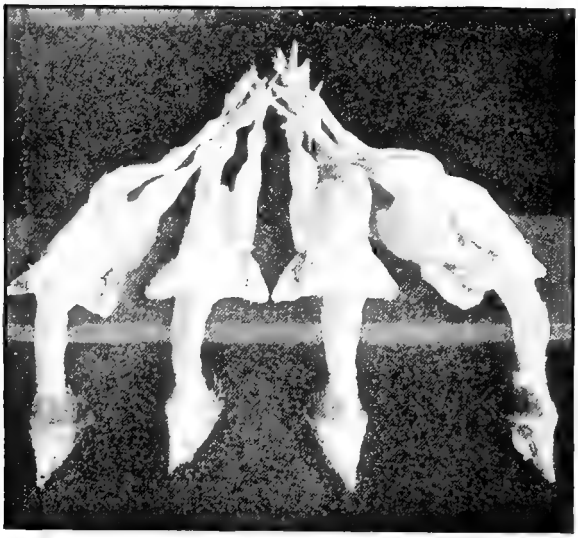

Fig. 2—TWELVE-OUNCE BROILERS DRESSED FOR MARKET

summer and fall. Incubators are started the last third of January, and from 8000 to 10,000 chickens are hatched out during the year. The breeds used for broilers are Wyandots and Plymouth Rocks. Said Superintendent Woodland: "Even for light weight broilers such as we produce, the small breeds like the

Leghorns are not satisfactory. They need to be two weeks older than the Plymouths to give the same weight.

"The chickens are not fed for the first day after hatching. Their first food consists of broken crackers softened in water, cooked mush and bird seeds. They are fed very often at first, four or five times or oftener, each day. As soon as they get well started their main soft ration is a mixture of corn meal and middlings, half and half, which is made early in the morning and allowed to stand until about nine o'clock and fed warm. The first feed, fed very early in the morning, is hard grain. Cracked corn, cracked wheat or cracked oats are fed at noon and at night. They get one quart of meat scraps in the mush for each 2000 chickens. For green food they have cabbages to peck at and clover hay steamed. Mica, grit, charcoal and water are kept constantly by them.

"They are kept warm by hot water pipes about six inches from the floor of the pen. Sand is filled in under the pipes to varying hights, according to the size of the chickens. The ends of the pipes nearest the broiler are warmest and the youngest chickens are kept there. A great point in raising healthy winter chicks is to keep them scratching. The grain and bird seed is always fed in sand or litter in order to make the chickens work for it. All our chicks are raised by incubators and brooders, and by comparison with hens which are used some years we find that we can hatch and raise twenty-five per cent more chicks by using incubators and brooders.

"In finishing off chickens for market, something depends upon our orders. When a lot of chickens are needed in a hurry two or three weeks hence, they are put in a fattening pen and fed all they will stand. Giving as great a variety of food as possible in feeding them, just before they get all they want the dishes are

taken away, leaving them a little hungry. Then the next feeding time they will be looking for more. They would not stand this high feeding process very long at a time, but when they are to go to market in two or three weeks, they can be quickest finished off in this manner. Chickens which are to be kept a longer time must be fed less, kept hungry all the time, so that they are ready to fly out of the pen when the man comes around with the feed. They must be kept scratching. The best we can do, we lose an average of three or four a day in winter.

"When the chickens are wanted for market they are carried in baskets to the killing house, where they are dispatched by stabbing the back of their mouth with a lancet. The head is not removed. They are not fed for twenty-four hours before killing and the entrails are not removed. They are dry picked and packed in pairs in pasteboard boxes made to fit. There is an ice box for cooling the dressed poultry in summer."

Intensive farming in or near a city, where the market is, can be carried on in no better way than in the raising of broilers. The following account of a city broiler plant is by W. M. Hayes, Hampden county, Mass.: "My lot is fifty by 150 feet, with a two-tenement house and stable that accommodates nine horses and sheds to cover wagons, sleighs, etc. The brooder quarters, as shown in Figure 3, occupy the second floor of the wagon shed, fourteen by fifty-two feet. The only heat obtained is from the brooder stoves.

"The brooders are arranged in a series, side by side, each two and one-half by four feet and without hovers. They are entirely homemade affairs and I consider them as practical as any without a regulator. One of the incubators holds 360 to 400 hens' eggs, the other 110 eggs. My first hatch was December 3. From then until summer I hatched 1279 chicks and raised as

broilers or sold to be raised 1067. I hatch thoroughbred stock, as such sell more readily. I sold several hundred at fifteen to seventy-five cents each, according to size and age, to be raised. Those that reached broilers so as to dress one and one-half pounds brought at wholesale $1.20 per pair and $1.50 to private trade.

"The most delicate part of this business is to raise them. Where there is no room to spread out growing stock, one must almost live with them to be able to

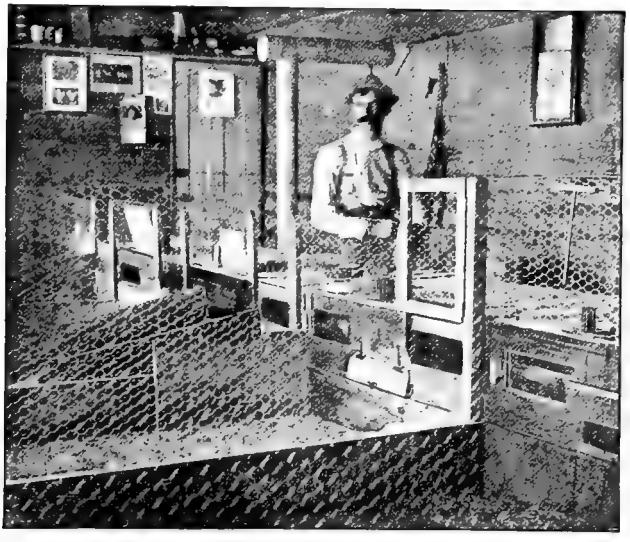

Fig. 3—BROILER RAISING QUARTERS ON A CITY LOT

satisfy their needs. They must be kept clean and healthy. I have learned that it is not any particular kind of food that is sure to raise the little artificially hatched orphans; more depends on proper temperature, ventilation and cleanliness than any prescribed method of feeding.

"The first three or four hours after taking from the incubator, put them in a clean brooder that has been heated to ninety degrees with top heat. The floor is covered one-half inch deep with sharp sand and sprinkled over the sand is a little chicken grit.

"Their first feed is a very little rolled oats; feed sparingly the first day, and also for a week. After being in the brooder twenty-four hours, they are fed every two hours for three weeks, chiefly on rolled oats, fine cracked corn and millet seed. From the first hour in the brooder, they are allowed all the fresh cold water they want. I have constantly before them in self-feeding boxes dry wheat bran, grit, charcoal and bone meal. I am often surprised to see how much dry bran they eat. At three weeks I give one feed a day of warm mash until nine weeks old, when they have all hard grain.

"Chicks like a variety, and I have to keep them guessing what they are going to get next. It is fun to steal in on them on the quiet and see them all rubber-necking in their curious way to see what is to come next. I always find pleasure in feeding almost any kind of green food, as well as profit; then when the time comes to feed fresh meat and bone, to see the little anxious, hungry things go over and over each other in their eager way to get the first mouthful of that favorite meal.

"If you use a brooder house in the second story, you must look out for leg weakness, as the sand and litter become very dry, and I find it necessary to sprinkle the runs at night after they have gone to bed. I had great difficulty in getting eggs with good, strong germs, which are most essential in raising chickens. I do not believe it is possible to produce good, strong-germed eggs from fowls that are closely confined; give them lots of range."

Small Broilers—Chickens hatched in December can be sold at eight to ten weeks of age when dressing twelve to sixteen ounces each, and after March 1 will bring the shipper ninety cents per pair. Those most in demand dress one pound each. These are called "squab broilers" or "individual chickens," and as the supply of game decreases from year to year, there is more demand for these small broilers, and it is quite profitable for raisers to use this size unless they have ample room to carry a small proportion over as roasting stock.—[W. D. Rudd.

To Finish Broilers for Market—When nearly large enough for broilers put the chickens into a pen having a shady run and a shady side. Here give them clean, fresh water once or twice a day, and all the fattening food they can eat. Muscle and bone-making foods, remember, are not required. Corn in various forms, however, should be fed freely to them. Cooked corn, mashed corn and ground corn, as well as whole corn, should be fed every day. Warm potatoes and bread crumbs will also make fat. Any kind of milk and a little sugar will likewise help along the fattening process, and this should be as fast as possible, for during these days the chicks will eat considerable, and if they do not lay on fat every hour it will be a losing operation.

To get hens which will produce eggs for hatching in December, January and February, hatch the pullets early, keep them growing and get them to laying so that by the time eggs are wanted you have them for the incubator. Keep the pullets growing well during the summer. Feed wheat and mixed grains. Keep free from vermin. Place in winter quarters about October 15.

Dressing and Marketing Broilers—We scald, pick all broilers and ship in barrels to Chicago, where we get from eighteen to twenty-two cents per pound. We take the feathers off, but leave the head and feet on, and

leave them undrawn. If shipped in warm weather we crush ice and put in a layer of broilers, then a large scoop of ice and so on until barrel is full, then put on a piece of ice weighing about twenty-five pounds. Put burlap over that and nail fast to barrel. If picked in cold weather use brown paper to line barrel, also use as layers between broilers. In scalding, do not scald head. If you do, it will look pale and white and make the chick look as if it was sick when killed, but if not scalded will show up red. This will make a difference of one to one and one-half cents on the pound. After they are picked, plump them in hot water not quite to a boil, then throw them at once in a barrel of cold water. After you are through picking and have the barrel full, throw some salt in the water over them. It will draw the blood out of the skin and make them show up white. Leave them in cold water until thoroughly cooled out, which will take from six to eight hours in hot weather.—[Burt Curry, Tennessee.

CHAPTER IV

NUTRITION FOR LAYERS

FOWLS, even more than any other class of live stock, require variety in their feed. None of the single grains is best for poultry. More than other classes of live stock, too, they require close attention and knowledge on the part of the feeder. It is almost impossible, by direct experiment, to determine the relative values of two different grains as a hen food for egg production, because so many other factors enter into the problem in each particular case.

If hens are fed their grain feed in such way that they have to exercise vigorously to get their daily feed they are much more apt to lay than if fed in troughs plenty of prepared feed, allowing them to remain idle. Again, if the rooms are either too warm or too cold the results are not satisfactory; or if the supply of green feed or of mineral matter be insufficient.

Wheat or rye is a good feed for fowls, but should constitute not over a third of the ration. Buckwheat is also a good feed, but starchy, and therefore to be fed in limited quantities only, and even corn, which turns out, on experiment, to be a particularly good feed, notwithstanding the opposition to it by theorists, should not constitute the sole grain feed. Give a mixture of the grain feeds scattered in cut straw or gravel, so the hens will have to scratch, and feed also cut bone and plenty of grit.

In order to get early eggs some extra feed in addition to the ordinary ration generally given by farmers is needed. As a rule the trouble on the farm is that after corn is gathered there is an overabundance of grain

lying around and in consequence the fowls become too fat. All farmers have hay to spare, at least they should have, and a few pounds per week fed to the hens will greatly increase the egg production. Clover hay is best, but any kind is good. Feed as follows: Cut into as short lengths as possible (one-quarter to one-half inch) and in the evening fill a two-gallon bucket full, cover and place on the kitchen stove and allow it to boil as long as there is fire. When the morning fire is built, allow the hay to heat again, then drain off the water and mix with the hay three quarts of wheat bran, or enough to make it crumbly, adding three pounds animal meal or scraps. This will make two gallons of feed. Give it to 100 hens as a morning feed. Remember this is for cold weather and for fowls that are at liberty on the farm.

In the evening, late, supply what they will consume of corn one day, and oats or wheat next, and so on. Be sure to give plenty of fresh water every day and on very cold mornings it is a good idea to make the water slightly warm. If you do not, it will freeze at once, and be of no service. Be sure the henhouse has good tight ends and sides and always front the house to the south. The warmer the fowls are in winter, without supplying artificial heat, the more eggs they will lay and the earlier they will become broody.

It is a mistake to feed poultry corn or wheat or corn and wheat exclusively. Corn is too rich in carbonaceous matter and wheat is substituted by some in order to avoid making the hens too fat. They overlook the fact that wheat contains a large per cent of starch also, and that it will fatten poultry almost as readily as corn. It contains more gluten than corn and is therefore somewhat preferable on that account, but to feed largely of wheat will just as surely make the hens overfat as corn.

A mixture of wheat and corn, or corn and wheat fed alternately, will fatten the fowls quicker than either fed alone, as variety helps digestion and less waste is sustained. Oats and buckwheat are excellent substitutes when needed, but no grain should be fed exclusively. Some grain is all right, but a part of the food for laying hens should consist of something else. Scalded corn fodder or ensilage, cooked turnips, small potatoes, etc., fed while warm, make excellent feed. The elements of any egg are derived from so many sources that no single food will answer the purpose. Hens to lay well must have a variety. To feed corn and wheat but partially supplies their wants.

Clover hay is a first-class egg food. It may be chopped fine, scalded with boiling water and allowed to stand over night in a covered vessel. Next morning mix with bran, season with salt and feed warm. Furnish green food by feeding cabbage, turnips, beets, potatoes, etc. Feed meat scraps two or three times a week. Give a variety of grain, wheat, oats, barley, buckwheat, and as the nights grow cold, feed nice, sound corn three times a week for their supper. This will help keep up animal heat during the long cold nights; it is much better if given well warmed. Beans and peas fed twice a week are good for laying hens. Linseed meal is also beneficial if fed sparingly; when given too freely it is apt to cause looseness of the bowels, and has a tendency to produce molting. Plenty of sweet milk is valuable, also clabber and buttermilk, though too much buttermilk will often cause bowel trouble.

Meat, fresh or dried, is a very good food. If a supply of poultry food be bought by the quantity in the fall, it will greatly lessen the feed bill. On almost every farm there are small, knotty apples, potatoes, beets, loose heads of cabbage, allowed to go to waste, which if gathered and stored will help furnish the

needed variety and also materially lessen the expense. Do not keep food constantly before the fowls, if you do not wish them to become disgusted and lose their appetite. Give tincture of iron occasionally in their drinking water. Reliable tonics and condition powders are all right in their place, but do not expect them alone to make eggs without giving the proper food, as seems to be the idea of some. Keep the hens at work. This is very important—you cannot give a laying hen too much exercise when cooped. An idle hen soon grows too fat to lay. Encourage them to scratch and work for their food, by throwing the grain among a litter of leaves and straw. Give them corn on the cob and throw them millet heads in which the seed has ripened and oats in the sheaf. Suspend cabbage heads with the heads downward, so that they can barely reach them.

The hens that in February are laying eggs for hatching must have a large amount of exercise, and must be fed a ration that will keep them in good condition—neither too fat nor too poor—and they must have good, fresh air, for eggs laid in ill-smelling quarters are not the eggs from which to expect chickens. It is easy enough to secure exercise for the poultry in winter. Just fill the pens eight or ten inches deep with refuse hay, corn butts, chaff and other litter, the whole underlaid with gravel, and keep the hens hungry enough to work diligently for the grain that is scattered in it. Feed a scant breakfast of mush that has bran, flour, corn meal, crushed oats and some kind of meat meal in it, and then keep the hens scratching all day for the few handfuls of wheat and cracked corn that are thrown, a little at a time, into the litter, keeping a window open in the pen when the weather will permit. At night give the hens all they want of cracked corn, oats, wheat and barley, and keep grit, charcoal and clean water before them all the time.

There is one other item in the bill of fare that must not be overlooked if we would approximate toward summer conditions. The fowls must have green food, and a certain amount of bulky food. So feed cabbage, raw, and cut clover that has been soaked in boiling water, giving these at night, or with the morning mush, or occasionally at noon (though not at this time in quantities to satisfy the fowls' hunger, else scratching will cease), and it will be found that the eggs, if not allowed to get chilled, contain strong and fertile germs.

It is generally considered that poultry like a variety of food and do better when the rations are frequently changed than where one or two things are fed continuously. A western poultry keeper, who has been very successful in securing winter eggs, varies the ration from day to day and feeds as follows: Monday morning, sheaf oats, night, warm mash; Tuesday morning, vegetables, noon, cut green bone, night, cracked corn scattered in litter; Wednesday morning, sheaf wheat, evening, warm mash; Thursday morning, vegetables, noon, whole wheat in litter, night, whole corn in litter; Friday morning, vegetables, noon, green cut bone, night, cracked corn in litter; Saturday morning, sheaf wheat, evening, warm mash; Sunday morning, vegetables, noon, whole wheat in litter, night, whole and cracked corn and wheat in litter.

The sheaf wheat or oats fed in the morning keep the fowls busy all day, so that no more feed is required. The mash consists of cooked potatoes or vegetables, cut clover and beef scraps, all mixed in a crumbly mass with some bran, shorts, chop feed, a little oil meal and salt, and sometimes a little powdered charcoal. Clean, fresh water is given them twice a day and oyster shells and grit are kept before them at all times. The houses are dry and warm and the fowls are fed only as much as they will eat up clean.

Watch the Flock—The feeder cannot depend on rules or rations except in a general way. He must learn to watch closely and adapt the food to the conditions. He may judge of the state of flesh by picking up the birds or passing his hand over them while at roost. Hens sagging down behind, beefy and lazy can be detected any time at a glance. They should be dieted or sent to market. When hens are too thin the breastbone is sharp. Hens tend to get too fat when not laying or sitting, also on approach of cold weather in fall. The older the fowls the more likely to get overfat. Heating foods, like corn, should be reduced in quantity at the approach of a warm spell. The condition of a flock, the weather, and the work the fowls are doing governs the ration. It is not needful to be constantly figuring out the nutritive rations, etc., if the owner has his experienced eye on the birds themselves, and understands the varied needs of his flock.

The droppings are an important indication, writes Dr. Woods: "The droppings should be of sufficient consistency to hold their shape, but should not be too solid. In color they should be dark, tapering off into grayish and white. If the droppings are watery and dark with red splashes of mucus in them, feed less meat food. If droppings are soft or pasty and yellowish or brownish, feed more meat and less starchy food. Greenish watery diarrhea should always lead to a careful investigation of the sanitary conditions and the condition of the food and water. It is a danger signal."

Feed Good Hens—With hens, as with cows, beyond a certain limit, all depends on the individual animal or bird, not on the feeding. The illustration, Figure 4, A Good Layer, shows a hen which laid 237 large eggs in a year. The picture, Figure 5, of A Poor Layer depicts another member of the same flock which laid only thirty-four eggs in the same period. A record

of the best layers is being kept at the Maine experiment station with the aid of trap nests. From the

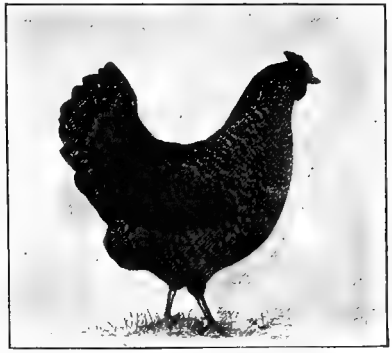

Fig. 4—A GOOD LAYER

best hens will be raised both cockerels and pullets with the aim of building a strain remarkable for heavy

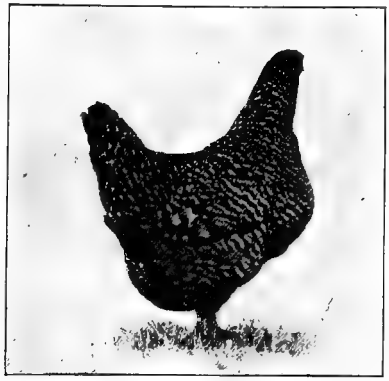

Fig. 5—A POOR LAYER

laying. Some of the poor hens might have been picked out on sight as lazy and beefy in appearance, but in

other cases the bad layers seemed as smart, well formed and vigorous as any. The trap nest is the only sure way unless each hen tested can be kept with a flock of another breed laying eggs of different color.

Feeding in Molting Season—Experiments in feeding fowls conducted by the Rhode Island experiment station seem to indicate that the ordinary rations supplied to laying hens confined in yards during the molting season are deficient in animal food material. The importance and value of meat and green bone in furnishing animal protein to balance the starchy grains is evidenced by largely increased egg production of the fowls fed upon a narrow ration, as compared with that of fowls receiving a wide or even a medium ration.

Whole or Ground Grain—Conclusions of the New York experiment station: Two lots of laying hens, of large and small breeds respectively, having their grain food only dry and whole, ate more food at greater cost per fowl and for the live weight than did two similar lots having about thirty-seven per cent of their grain ground and moistened.

A pen of Leghorns, which had for the year thirty-seven per cent of their food ground and moistened grain, produced eggs at a greater profit than did an exactly similar pen fed whole grain.

Of two like pens of Cochins, the one fed whole grain produced eggs at much less cost than did the pen having ground grain, which result is attributed partly to the exercise assured in feeding whole grain.

With the kinds of whole grain ordinarily available it is not possible to feed a largely grain ration having as narrow a nutritive ratio—that is, containing as large a proportion of the nitrogenous food constituents—as is perhaps necessary for best results from laying hens.

By using some of the highly nitrogenous by-products (such as cottonseed meal, pea meal, gluten feed,

etc.) with ground grain, it is possible to feed a somewhat narrow ration without feeding an excessive amount of meat.

With hens fed similar rations, when the hens of smaller breeds give only the same egg yield as the hens of larger breeds, the eggs are more cheaply produced by the smaller hens, but considering the cost of raising and the ultimate poultry value of the hens, the profits will be equally or more favorable for the larger hens.

What to Do with Fat Hens—When a hen becomes very fat, she is not only a poor layer, but will become broody, droopy at times, have leg weakness, and be unfit for anything but the pot. Such hens should be fed only once, at night. The meal should consist of a pound of lean meat to twenty hens, with a handful of grain scattered for them to hunt up. They will then be hungry through the day, and search for food, while the inducement of a few grains thrown out at night will cause them to keep at work until late. Meat contains little of the fat producing elements, if lean, and will greatly promote laying as soon as the surplus fat is removed, which can only be done by compelling the hens to exercise. If the hens are kept on this exercise diet for a week or ten days, they will be in better health afterwards; and if they lay well, the one meal per day may be continued.

A Fowl's Digestive Machine—The gullet takes root from the back of the beak, runs along the neck, behind the windpipe, and ends in the abdomen, a little to the left. In the hen there exist three divisions or receptacles for food. The first one is the crop, which receives food as soon as swallowed. A little farther along in the breast is the gullet, which contracts and expands so as to form a second receptacle, with thick walls. Next we find the third receptacle, very muscular and large, known as the gizzard.

The small stones swallowed by the fowl are found in the gizzard, and naturalists say they facilitate the operation of digestion by the contracting of the muscular lining, causing the stones to grind the food. This last stomach is formed by a thick and very strong muscular membrane, the external fibers of which are of a tendonous nature. The internal membrane which lines the gizzard is very thin, fibrous and hard. It secretes a coloring matter, which appears to have the property to dissolve stones, principally carbonate of lime. Flint requires a longer process. Liquids taken as drink appear to be absorbed by the first and second stomachs; they are never found in the gizzard unless in case of disease. It is worthy of remark that a hen eats, when in health, about two ounces of limy or flinty sand a day. The salivary glands are small in a fowl and produce a liquid thick and slimy, but the quantity is very small.

The liver is very large and divided into two lobes of equal size. The gall bladder is attached to the liver and contains a thick bile, very bitter. The pancreas pours a fluid into the intestines by two small tubes. The spleen is very small, of cylindrical shape and placed behind the liver. Its function seems to be to keep in reserve and prepare the blood used as one of the secretions necessary to digestion. The circulatory apparatus is not different from that of animals. The heart has four cavities and the arteries are the same.

In Figure 6 the abdominal muscles have been removed, as well as the sternum, heart, trachea, the greater portion of the neck, and all the head except the lower jaw, which has been turned aside to show the tongue, the pharynx and the entrance to the larynx. The left lobe of the liver, succentric ventricle, gizzard and intestinal mass have been pushed to the right to exhibit the different portions of the alimentary

canal and to expose the ovary and oviduct. 1, tongue; 2, pharynx; 3, first portion of the oesophagus; 4,

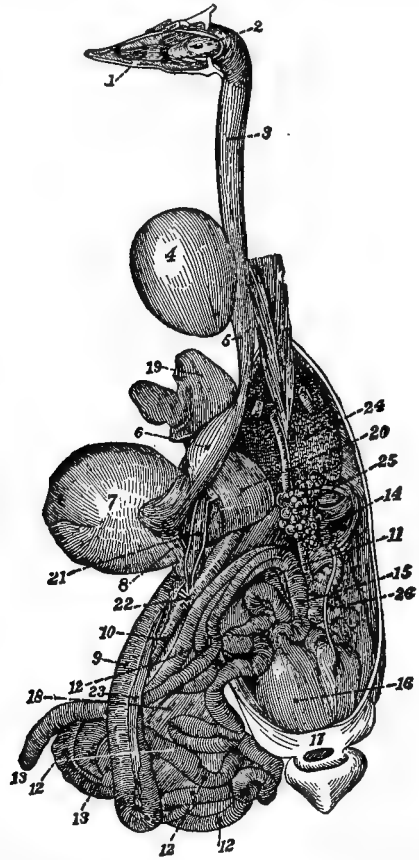

Fig. 6—ANATOMY OF A FOWL (Howard)

crop; 5, second portion of the oesophagus; 6, succentric ventricle; 7, gizzard; 8, origin of the duodenum; 9, first branch of the duodenal flexure; 10, second branch

of the same; 11, origin of the floating portion of the small intestine; 12, small intestine; 13, free extremities of the caeca; 14, insertion of these two organs into the intestinal tube; 15, rectum; 16, cloaca; 17, anus; 18, mesentery; 19, left lobe of the liver; 20, right lobe; 21, gall bladder; 22, insertion of the pancreatic and biliary ducts; 23, pancreas; 24, lung; 25, ovary (in a state of atrophy; fowl not laying); 26, oviduct.

Poultry Facts—The body of a fowl is composed of more than half water. For 100 hens about sixteen quarts of clean water per day are required. In each dozen eggs there is about a pint of water.

Each 1000 pounds live weight laying hens of average size require from sixty-five to seventy pounds of grain food per day. On this ration the hen could be expected to produce from sixteen to thirty pounds of eggs. One pound of eggs may be produced from about three-fourths pound of water-free food, and one pound of dry matter of eggs corresponds to each 8.8 pounds of water-free food. For the 1000 pounds weight of hens of the larger breeds, forty to fifty pounds of grain food per day, containing about thirty-four pounds of water-free food, is sufficient. The proportion of nutrients should be about six pounds digestible protein, fourteen pounds digestible nitrogen-free extract and two pounds digestible fat.

A hen of the large breeds, when laying, requires about four and one-quarter ounces of food per day; Leghorns, while laying, require about three and one-half ounces of food per day. Chickens require more food in proportion to their weight than older fowls, or about 10.6 pounds to every 100 pounds live weight per day when very young. At two pounds weight, the ration required drops to 7.5 pounds; at three pounds weight to 6.4 pounds; at six pounds weight to 4.9 pounds; at seven pounds weight to 4.7 pounds per day.

These rations are for grain feed; green food and extras should also be fed.

Various Grains—Sorghum seed is somewhat like corn in composition and effect. Such grains as Kafir corn, milo maize, millet, durra, chicken corn, may be fed to some extent in place of wheat for variety. Some of these grains are small and make good chick food or a good scratching food for fowls. Hulled broom corn seed is about equal to wheat.

Standard Grains—Corn is heating and fattening. It should be balanced with meat, bone, bran, gluten, linseed and such feeds. Cracked corn if fed dry should be sifted to prevent waste. Corn on the cob is a handy farm feed and affords some exercise. Corn or meal which has been injured by heating and souring should never be given young chickens.

Wheat is considered the safest grain, but is usually more expensive than corn. Number 2 wheat if bought with care is nearly equal in results to Number 1, if merely small, broken or scorched. But screenings contain many seeds not eaten by the fowls, while sour or burned wheat is not satisfactory. Bran, shorts and middlings are good with corn meal but not relished alone. Waste bread from bakeries, soaked and mixed with middlings, is good for fowls and chicks.

Oats are fed chiefly for variety, not being well liked on account of the husk, unless clipped, when they are relished and make one of the best of whole grains to produce eggs. They are a good offset to corn and nearly as nutritious as wheat. Coarse oatmeal and rolled oats are good chick food and easily fed dry.

Barley is much like wheat in results but is less relished. It need not be fed unless it can be had cheap. Barley shorts are very nutritious.

Buckwheat is fattening and quite well liked by fowls, but not much used except where it is especially

low in price or home raised. Buckwheat middlings are rich in egg material and a good mixture with corn meal. The same may be said of rye bran, but whole rye is thought to cause bowel trouble if fed freely.

Homemade Egg Food—The majority of egg foods are composed of those elements that enter into the composition of an egg, and their success depends upon the fact that they supply material which is often overlooked by those who keep poultry. For instance, ground bone, ground meat, salt and charcoal are ingredients—the first to supply the phosphates; the second the albumen; the third, that which is not often supplied, and the fourth a corrective. Hence two pounds of ground bones, two pounds of ground meat, four ounces of salt, a pound of charcoal, two pounds of linseed meal, with an ounce each of sulphur, baking soda and ginger, makes a very good egg food, which may be given to six fowls daily, using a gill mixed with other food.

Egg Producer—Exhaustive experiments have proved that the use of an egg stimulant, while it forces the pullets to earlier laying, does not increase the total yearly egg yield and that there is no profit in its use. For those who wish to use something of the kind, the following formula may be prepared for about thirty-five cents and will give an egg producer as effective as anything: Cantharides, ninety grains; ginger, thirty ounces; gentian, one and one-half ounces; capsicum, six ounces; Venetian red, two ounces; sulphur, three ounces; charcoal, one ounce; oil meal, thirty ounces; all should be ground finely and well mixed. Use one and one-half teaspoonfuls to the quart of hot mash, which is enough for twelve average fowls.

Condition powders are mainly composed of stimulating, spice-like drugs, such as gentian, fenugreek, anise seed, ginger, etc. The effects are because of the tonic or stimulating nature of the materials employed.

CHAPTER V

SPECIAL FOODS

OWING to high prices of grain, which make large inroads into the receipts of poultry keepers who must buy a large proportion of the feed, the question has often been asked if something could not be used in place of so much grain. The hen has a small crop and cannot make use of a great amount of coarse, bulky foods as can cows and other ruminants. The grain ration can be advantageously cut down one-fourth or more by the liberal use of clover and vegetables, but where this is done a large proportion of the wheat bran, which is also bulky food, should be left out.

Very finely cut clover or alfalfa, or clover meal, can be steamed and mixed with the mash, or the noon ration may consist of steamed clover to which is added some wheat middlings and corn meal. Vegetables can be fed either green or boiled and mixed with the mash. Corn silage makes an occasional relish and is very cheap. Whole grain should be fed at least once a day. Barley is sometimes one of the most economical feeds to buy and is very good fed either ground or whole. Meat scraps or green cut bone are cheap considering the matter which they contain.

Animal Matter—It is well known that poultry when allowed to range at will eat considerable quantities of animal matter in the form of insects, worms, etc.

How necessary this animal matter is to the health of fowls, and especially ducks, was strikingly brought out by experiments at the New York state experiment station. Two lots each of chickens and ducks, as nearly alike as possible, were used in these experiments. One

lot in each case was fed a ration of mixed grains and skimmilk or curd, containing no animal matter, the other ration of mixed grains, with animal meal and fresh bones or dried blood. The two rations were about equally well balanced, although the "animal matter" ration contained a little less protein than the "vegetable matter" ration. The distinctive difference between the two rations was that in the one case two-fifths to one-half of the protein came from animal sources, while in the other it all came from vegetable sources. Two trials were made with chickens.

In each trial more food was eaten by the lot receiving animal protein, the gain in weight was more rapid, maturity was reached earlier, less food was required for each pound of gain, and the cost of gain was less.

During the first twelve weeks of the first trial (starting with chickens one-half week old) the chicks on animal meal gained fifty-six per cent more than those on the vegetable diet, although they ate only thirty-six per cent more; they required half a pound less of dry matter to gain one pound, and each pound of gain cost only four and one-quarter cents, as compared with five and one-fifth cents for the grain-fed birds.

During the next eight weeks the cost of gain was seven and one-half cents and eleven and one-fifth cents, respectively. The animal-meal chicks reached two pounds in weight more than five weeks before the others; they reached three pounds more than eight weeks sooner, and three pullets of the lot began laying four weeks earlier than any among the grain-fed birds.

With the second lot of chicks, starting at six weeks of age, the differences were in the same direction, though not quite so striking, thus showing that the great advantage of the animal nitrogen is in promoting

quick, healthy growth and early maturity rather than increasing the tendency to fatten. (See Figure 7.)

The results were most convincing, almost startling, in the case of ducklings fed the contrasted ration. Before the experiment had been long under way it was noticed that the animal-meal birds were developing rapidly and evenly, but the grain-fed ducklings were becoming thin and uneven in size. It was sometimes almost pitiful to see the long-necked, scrawny, grain-fed birds, with troughs full of good, apparently wholesome food before them, standing on the alert and

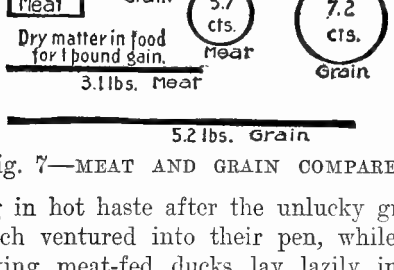

Fig. 7—MEAT AND GRAIN COMPARED

scrambling in hot haste after the unlucky grasshopper or fly which ventured into their pen, while the contented-looking meat-fed ducks lay lazily in the sun and paid no attention to buzzing bee or crawling beetle. The thirty-two meat-fed birds lived and thrived, but the vegetable-fed birds dropped off one by one, starved to death through lack of animal food, so that only twenty of the thirty-three were alive at the close of the fifteenth week of contrasted feeding. They were then fed for four weeks on the meat meal ration and made nearly as rapid gains as the other lot at the same size two months before, but they never quite overcame the disadvantage of their bad start on grains alone.

In conclusion, then, it may be said that rations in which from forty to fifty per cent of the protein was

supplied by animal food gave more economical results than rations drawing most of their protein from vegetable sources. The chief advantage was in the production of rapid growth, although the cost of production is also in its favor. While inferior palatability may have had something to do with the marked results, especially with the ducks, the whole bearing of these experiments and others not yet reported seems to indicate that the superiority of the one ration is due to the presence in it of animal food.

Ducklings certainly need meat or animal food in some form. James Rankin, the veteran Massachusetts duck raiser, feeds one part hard-boiled eggs and three parts stale bread crumbs the first three or four days. After that he gives equal parts wheat bran, corn meal and boiled potatoes with a little beef scrap. The largest duck raiser on Long Island, A. J. Hallock, feeds equal portions of wheat middlings, corn meal, crackers or bread crumbs with green food for the first week. After this the ration is made of four parts corn meal, two of bran, one of middlings, one of beef scrap and about four parts green food. A handful of sharp sand is added to each quart of the mixture.

Fresh Green Bone—Green bones are not used as extensively as they should be, because grain can be obtained with less difficulty, but as egg producing material, the bone is far superior to grain; nor does the bone really cost more than grain in some sections. Bones fresh from the butcher have more or less meat adhering, and the more of such meat the better, as it will cost no more per pound than the bone, while the combination of both meat and bone is almost a perfect food from which to produce eggs.

If the farmer can get two extra eggs per week from each hen in winter, he will make a large profit, but if the product is increased only one egg per week in

winter, that one egg will pay for all the food she will consume, so it pays to feed the material that will induce egg production. It is frequently the case that poultry receive a sufficient quantity of food but not of the proper kind to induce egg production.

A pound of green cut bone per day is sufficient for sixteen hens and such quantity ought not to cost over one cent. Where fowls have yard range one quart of grain at night and one pound of cut bone should be sufficient for sixteen hens per day in winter. In summer only the bone need be fed. Such a diet provides fat, starch, nitrogen, phosphates, lime and all the substances required for egg production. As eggs sell for about three cents in winter, it is plain that it is cheaper to feed bone than grain. In this connection a bone cutter will be found necessary, which may reduce the profits the first winter, but where a cutter is first introduced among a community of poultry keepers it is more than likely cut bone can be sold by the pound to neighbors.

At the Ohio state university an experiment was made to test the value of green bone as a food for laying hens in connection with oyster shells and gravel. The trial was made with four divisions and two pens in each division, one of old hens and one of pullets, ten to each pen; first division were fed green cut bone, crushed oyster shells and gravel, second division received green cut bone and gravel, third division crushed oyster shells and gravel, fourth division gravel only. In the first the ten pullets laid 140 eggs, the ten hens sixty-four, total 204; second division pullets 115, hens eighty, total 195; third division, pullets seventy-nine, hens four, total eighty-three; fourth division, pullets fifty-two, hens thirteen, total sixty-five.

The first division received fourteen pounds raw cut bone, two pounds oyster shells and all the gravel

they wanted. Second division received fourteen pounds raw cut bone and all the gravel they wanted. Third division received six pounds oyster shells and gravel. Fourth division received nothing but gravel. Counting bone at three cents per pound and shells at two cents, the hens fed with cut bone more than doubled in value of eggs. There was enough difference in those fed shells to more than pay for the shell, but left a narrow margin when fed with bone. Those fed bone more than doubled on those fed nothing but gravel, or by the test twenty cents per pound could have been paid for the cut bone, while eggs brought twenty-five cents per dozen. The hens that received the bone possessed a much better plumage and wintered much the better.

It is a highly concentrated food and must be used cautiously. The only danger lies in feeding too much or in feeding that which is sour or moldy. The one results in forcing the chicks or fowls "off their feed," and in leg troubles, and the other in diarrhea and bowel complaints. The maximum ration for laying hens is one-half ounce per day.

The use of green cut bone not only increases egg production, but lessens the food cost of eggs. This is very clearly shown by an experiment carried out by the Hatch experiment station of Massachusetts a few years ago with two lots of hens and pullets, nineteen in each lot, and continuing seventy-nine days from February 9. The food for one lot was in pounds as follows: Whole wheat 99.5, oats 100, wheat bran 18.5, wheat middlings 18.5, Chicago gluten meal 18.5, ground clover 18.5, green cut bone 10, total 283.5, cost $3.25, nutritive ratio 1 to 4.8. The other lot received essentially the same food, except that in place of the green bone it got 9.7 pounds animal meal. The total food was 287 pounds, cost $3.26, nutritive ratio 1 to 4.9. The lot receiving green cut bone laid 269 eggs at a cost of .910

pound dry matter in food per egg and 1.2 cents for food consumed, while the other lot laid 145 eggs at a cost of 1.796 pounds dry matter and 2.2 cents for food consumed. This included the cost of labor for cutting the bones.

Quite similar results were obtained in more recent experiments by the New York experiment station. Here it was found that for laying hens the rations containing animal food proved superior to others in which all the organic matter was derived from vegetable sources. The hens fed green cut bone laid more eggs and at a less cost per egg for food consumed. Pullets raised on food containing considerable bone began laying much earlier than those fed corresponding rations made up of vegetable food. This point is of the greatest importance to poultrymen and farmers who know of the difficulty of getting late hatched pullets started to laying before cold weather sets in. Once get them laying, and with good food, care and warm quarters they will lay well during the late fall and early winter, when eggs are highest, but if they cannot be started before the holidays it is almost impossible to get any profit out of them before every other hen and pullet starts laying toward spring and the price of eggs goes down with a thud.

For raising young chicks and ducks green cut bone as a food has no equal. Nothing will approach it in putting on growth and weight, more particularly with ducklings than with chicks. Ducklings without an abundant supply of animal protein in the ration, together with a liberal proportion of vegetable matter, seem unable to make any approximation to their normally rapid and most profitable growth.

Scrap bone is obtained at markets or packing houses, and the short soft bones with meat adhering to them are preferred. These are ground up in machines

made on purpose, which are not expensive. The cut bone may be mixed and fed in the mash, but it is preferable to feed it alone. Fowls and chicks are very fond of it, and it is the best exerciser for them. Scatter it at noon in the straw or litter on the floor and there will be such a scratching for it as you have seldom seen. It is a good practice to feed it three times a week, although a little may be given daily. It should be fed at a regular hour on certain days, for when the hens get accustomed to it they are uneasy unless it is given them at the expected time. The only precautions necessary to observe are never feed too much, nor any which is tainted.

The West Virginia experiment station has compared the value of bone and meat meal for egg production, with results decidedly in favor of the green bone.

During a period of four months, beginning October 25, seventeen Plymouth Rock hens fed the fresh bone laid 650 eggs of an average weight of 11.75 pounds per 100, while a similar number fed meat meal in their ration laid 554 eggs, weighing 11.94 pounds per 100. The fowls fed fresh ground meat and bone also increased more in weight and were much healthier during the experiment, four of the others having died, and being replaced by others. As this experiment was made with only one sample of meat meal the results cannot be considered conclusive.

Horseflesh—In Anglo-Saxon communities there is a strong prejudice against horseflesh as food. The objection, however, can scarcely apply to the use of it as poultry food, since fowls consume far less attractive food in the course of their foraging and without injury to the egg and meat product. Writes J. J. H. Gregory, a veteran agriculturist of national reputation:

"Some twenty years ago, the horse of a neighbor having met with an accident had to be killed. The

animal was perfectly healthy and it occurred to me that his flesh would serve excellently for hen feed. I accordingly offered a bag of meal for such parts of the carcass as I might choose to take, provided the owner would land the flesh on my place. The bargain was made, and the body having already been skinned, I found no great difficulty by the use of saw and knife in cutting up the largest part of the remains. These as soon as landed I packed in snow (it was early winter) in a couple of large sugar boxes which I kept out of doors with covers to protect from rain. The flesh lasted as the animal food for eight hens about through cold weather. I fed it raw, cutting it fine. Under it the hens were healthy and laid remarkably well, the eight averaging six eggs a day throughout the winter. The meat was fed very liberally. But not everyone indorses raising eggs on horse meat.

"There was a society of old retired sea captains who used to meet at their rendezvous over the bank daily, to discuss the affairs of the world and express their emphatic opinions on the degenerate state of matters and things in these latter days. Honest old sea dogs that they were, they decided that Gregory ought to be prosecuted for selling eggs from hens fed on horse meat! It is but the other day an intelligent man asked me my opinion on the subject, stating that a neighbor was about to kill a horse too old for service. That an intelligent man should ask such a question showed how widespread is a ridiculous prejudice.

"What is the difference between the food of a horse and the food of a cow or ox? Then can there be any difference between the flesh of either of them from a health standpoint? If it be conceded that it is but a matter of shrinking on our part from unaccustomed food, let us bear in mind that no hen has thus far been found troubled by any such qualms. It is certainly

true that some horses die from diseases whose flesh we would not care to feed, but this would make but a fraction of their number unsuitable for hen feed, for if properly attended to the great number that it becomes necessary to kill because of injury through accidents, and even the many who die from colic, if immediately dressed, as well as the large proportion whose lives are taken because they outgrow their usefulness, all these can be more profitably utilized by sending them to the hencoop rather than to the manure pile. Where the poultry keeper lives near fertilizer works he has opportunities to secure his hen meat as he wants it and at a very low figure."

Fish and Turtle—When I get fish I cook it and mix it with the mash, using less of the shorts. From January to May I can get fish once and sometimes twice a week. While pumpkins last I feed raw all the fowls will eat, also cook and mix them with the mash. I also have a pen in which I put muck and fresh fish. The hens pick out the maggots as they come to the top and I take the rest for fertilizer. I feed the young chicks, until they are old enough to leave the brooder, ground parched corn with a little shorts and all the insects and worms I can find. Fresh water, in iron dishes, is kept where they can get it all the time, and it is changed several times each day. I often dust laying and sitting hens with flowers of sulphur and have no lice or fleas to speak of at any time of year. I sometimes find a soft-shelled turtle, which I cook, chop up and mix thoroughly with shorts. Fish I sometimes feed raw, chopping it very fine and mixing with shorts. I grind cabbage in a meat chopper and mix with shorts for the little chicks in the brooder.—[D. D. Doane, Florida.

Whey Cream—One day, noticing chickens standing on the edge of the whey tub and pecking at the dried

cream on the sides, I skimmed some and placed in a dish. They ate it all eagerly, although they were well-fed chicks, and subsequent feedings convinced me that it formed a valuable addition to their diet. On cooking, their flesh was exceedingly sweet and tender, and in no way had an oily taste, which many might raise as a possible objection. Doubtless if fowls are kept in close confinement and given little else but this waste cream, a characteristic oily flavor to their flesh might result. As it was waste matter that cost nothing, I considered its utilization in this direction a most profitable one. As is generally known in cheese manufacturing districts, all of the cream from whole milk cannot be worked into full stock cheese. It is this small per cent of unavoidable waste, rising in the whey tub and either going to the hogs, or as a rendered product being utilized as cheese dressing, that I recommend all who can to try on growing chicks.—[G. E. Newell.

Skimmilk—One hundred pounds of skimmilk will make as many pounds of eggs or poultry as it will of pork or veal. With me the hen is the only variety of fowl that will use skimmilk. Geese and turkeys won't touch it.—[M. L. B., Vermont.

Bulky Food—Fowls need bulky food. For not only are bulky foods needed for the special forms of nutriment they contain, but to distend the crop and enable the fowls the better to obtain the nutriment from more condensed foods. Such foods as finely cut grass, clover and the like have a value greater than their analysis would indicate. Fed upon such foods in connection with more condensed articles of diet, fowls seldom contract the bad habit of feather pulling. This habit seems to be due to two causes: lack of animal matter and lack of bulky food. Given these two elements and feather pulling would hardly be known, unless it was introduced into the flock through

some vicious individual which first contracted it through lack of these forms of food Such foods will frequently put a stop to the habit after it has been contracted.—[H. S. Babcock, Providence County, R. I.

Green Feed—Its value in abundance for laying hens is strikingly shown in an investigation made by the West Virginia experiment station. Forty White Leghorn hens and four cocks were divided into two similar flocks and placed in two houses, side by side, the middle of July. Both flocks were allowed runs fifteen feet wide and 100 feet long, and both had access at all times to such grass and herbage as grew in the runs. In addition to this, one flock received an abundance of green food. At the end of the year, the fowls which had the green food had laid two dozen more eggs per hen than the other.

Clover Pasture—In my locality, where we usually have some warm weather and but little snow during November and December, it pays me to sow crimson clover for pasture for the poultry. The land which I use for market gardening adjoins my poultry yards, and my plan is to sow crimson clover as a catch crop between the rows of garden vegetables, then when the vegetables are gathered give the fowls the range of the field during the pleasant weather of the late fall and early winter when the other grasses do not supply green food for them. Crimson clover seems to be especially adapted to this purpose, as, unlike other clover, it remains green after the hard frosts of early winter. If it has been found that the crimson clover does not endure the winter in your section, then sow a little rye with the clover, and if the clover winter-kills, the rye will survive. With such a pasture for the hens now and some clover rowen dried and put away for later use, you are in the way to make a good profit from the hens next winter.—[W. H. Jenkins.

Special Feed Crops—Young lettuce leaves will add greatly to the health and growth of the chickens. Onions should also be grown and kept for feeding. If chopped moderately fine, they will be eagerly consumed by fowls. Tobacco should also be grown and used to keep the stock free from lice. Pull the plants before frost, and hang them in the barn or shed to dry. A handful of the leaves in the nests of sitting hens will add a great deal to their comfort and more to that of the young. Beans, well cooked, either whole or ground, will help fill up the list of foods. Rape seed is easily raised, and would be useful for choice young chickens. Seeds of the common millet, Golden millet, sorghum and broom corn will make a variety in the list of good, cheap foods. Egyptian corn, a kind of sorghum, is valuable for young or old fowls. Barley, rye and oats are all acceptable to poultry.—[E. M. Hess.

Cabbage—My experience with cabbage is that about the very best use one can make of loose heads is to make them up in sauerkraut; then as soon as worked a little, put where it will freeze, so as to keep them. Use it once a day as a part ration of food. They relish it very much. In this way one can supply a great amount of extra rations for the poultry that usually goes to waste. Put away in this way, one has a fresh supply in a small compass until grass comes. Use but little salt; for one large barrel I use only a teacupful. Pound it well, put heavy weights on and it will keep until warm weather. Keep in an outbuilding because of the odor.—[D. E. Hale, Allegheny County, Pa.

Mangels—The yield of this beet, according to the amount of ground taken up by it and the time and expense of cultivating, is immense. It is little trouble to harvest and easy to keep in the winter, either in pits or in the cellar. If it is desirable to feed raw, the

chickens will enjoy picking out the inside, if the beet is split from crown to root. If cooked, it can be cut or chopped and mixed with the other steamed or cooked food.—[J. L. Irwin, Nemaha County, Kan.

Onions will quickly affect flavor of eggs or meat. So will muskrats. After removing the pelts of some that I caught one winter the carcasses were thrown in a field not far from the barn, where the hens ranged and fed on the meat. This produced such a musky flavor in the eggs that afterward care was observed to keep the dead rats out of the hens' reach. At a later period I purchased a quarter of beef from a farmer who, while fattening a number of steers, fed a large quantity of turnips. These so tainted the meat that it was decidedly distasteful, and when cooking there was a pronounced smell of turnips.—[S., Schuylkill County, Pa.

Rice—While living in California, I was quite largely engaged for about ten years in raising poultry for market, both with incubators and with hens. I had trouble with young chicks on account of more or less diarrhea, sometimes but little, and again considerable, but always some loss from it. Since coming to the islands, we have not been in the business extensively, but raise more or less each year. For three or four weeks we feed on broken rice and milk. We never have a case of diarrhea here or a sick chick, although they have to be kept in close quarters on account of the mongoose, but of course have to be kept clean, but are never let outside of wire fence until fully grown. If we had known the value of rice as a feed for starting young chicks, when in the business in California, it would have been several hundred dollars in our pockets, if not thousands.—[I. S. Garnett, Hawaii.

Nuts—When one has an oversupply of nuts, especially black walnuts and butternuts, they can be used

to good advantage among the poultry, serving the purpose of meat, the oil in the nuts being of the same nature. Crack them rather fine and the fowls will pick the shells clean in a short time.—[Marion Meade, Illinois.

Odds and Ends—Nothing excels the scraps which accumulate on the table, including, as they generally do, vegetables, meat, etc. A farmer's table yields in the course of a year a large amount of bones, which, when ground or chopped fine, produce food far more valuable than grain for egg production.

Various Foods—Old or damaged cheese is a good egg food. Popped corn from the factories is a cheap food, being equal to raw corn, pound for pound. If the corn is sugared, so much the better for fattening. Refuse bread, cake and crackers make convenient food for chicks and take the place of as many pounds of grain. Scorched grain at about two-thirds full price will do for a part of the ration, if not so badly burned that part will be left on the ground. Grain screenings are of doubtful value for fowls, but chicks will eat most of the seeds.

Ground tankage from tallow and fertilizer factories is the cheapest animal food, but if tainted or diseased, will cause trouble. The same may be said of dried blood. Raw lights and offal from the slaughter house often cause disease, but are safe if cooked thoroughly. If fed raw, care should be taken to examine before feeding for traces of disease.

Gluten meal is made from the chit or nitrogenous part of the corn grain and is the refuse from the manufacture of cornstarch. It contains nearly thirty per cent nitrogenous matter, whereas the pure corn meal contains only about nine per cent. Cottonseed meal and linseed meal of course are entirely different articles, but they are both very rich, cottonseed meal

containing about forty per cent of nitrogenous matter, and linseed meal fully thirty per cent. The new process linseed meal can be used without bad effects to increase egg production if judiciously fed, but the old process linseed meal, containing ten per cent of fat or oil, is too fattening for layers. This is one objection to cottonseed meal, which has twelve to thirteen per cent of fat, whereas the gluten meal has only about five per cent of oil. Proper care in feeding either of these concentrated meals will enable you to use them in the poultry yard. Begin feeding them very lightly, and increase as experience shows you can safely do. Never feed such rich food exclusively—give it in connection with a variety of other stuff.

Garbage from village or city swill will do to feed once a day to hens, if it is well cooked and mixed with ground feed of some kind. As long as hens thrive on this feed and remain in good health there is no objection to feeding it.

Sour food induces bowel trouble. Don't leave any about. Feed only what will be eaten within twenty minutes.

Cider pomace will be eaten quite freely by fowls in winter and serves the same purpose as roots or green food, at less cost. Preserve the pomace in hogsheads or tight barrels and press down the contents with jackscrews or barrel headers.

CHAPTER VI

TO FINISH AND DRESS CAPONS

THE price of dressed capons in season is nearly equal to that of broilers, while the cost per pound to produce is far less. On many farms, a number of young cockerels are kept through the winter, growing but slowly and consuming their full value in grain by February. If these had been caponized the only added cost would have been a few minutes' time and the loss of perhaps one bird in forty as the result of accidents in operating, while the capon would weigh at maturity nearly twice as much as the cockerel and bring five to ten cents more per pound because of his more soft and rich flavored meat.

The idea applies especially well to late hatched and autumn chickens which are too small to sell during the holiday season. The pullets will make prime summer layers, and the cockerels caponized will come into market at the time when capon quotations are at their best, in late spring and early summer. If the house is warm and the winter not too severe they will grow fairly well all winter and will increase in weight rapidly as soon as milder weather begins. No surplus males should be kept over winter uncaponized.

Finishing Capons—The plan described below is that used at the Ontario experimental farm, as related by W. R. Graham. The illustration, Figure 8, shows a capon ready for market. "The rations tend to produce a light, cream-colored flesh, which is in demand in the English markets and the high class Canadian trade. Where yellow flesh is in demand the addition of a small proportion of yellow carrots, say one-sixth of the ration, would tend to deepen the color. Cotton-seed meal has the same tendency.

Fig. 8—CAPON DRESSED FOR MARKET

"Chickens and capons can be fattened to best advantage by confining them in small coops for three or four weeks previous to killing. The ordinary coops used for fattening purposes are made six and one-half feet long by sixteen inches square, inside measurement. Each crate is divided into three compartments and each compartment usually holds four chickens. The crates are made of slats about one and one-half inches wide and one-half inch thick. The slats run lengthwise of the coop on the top, bottom and back, the front being upright, with a small door arranged in each compartment. This coop we have found easily cleaned and convenient. Small V-shaped troughs are arranged in front, from which the fowls are fed and watered. All our experiments tend to show that this is the best way to fatten fowls. They do better than when at large, or when confined to small pens.

"The feed should be of ground grain dampened with skimmilk or meat broth. Of eight different rations tried here for fattening purposes, we have found the following two the best: (*a*) Two parts ground corn, two parts ground buckwheat and one part fine ground oats, all by weight; (*b*) two pounds ground corn, two parts ground oats and two parts cooked potatoes, all by weight. Ration *a* is relished by the birds and has made more rapid gains than *b*, but *b* ration is less expensive and has produced gain at a less cost per pound, while *a* has produced the most gain. In districts where buckwheat can be purchased for about thirty-five to forty cents per bushel, *a* would be a very advantageous ration to use.

"Our method is to feed these rations from the small V-shaped trough for two weeks, after which the birds are forced by the use of the cramming machine. The machine-feeding lasts for about ten days. Nice, plump, fat chickens can be produced without the

crammer if fed for about a week longer, but in our trials they lack the uniformity and evenness of condition which is characteristic of most crammed chickens."

How to Dress Capons—First be sure and not kill them until crops are empty, and that they are fat. A thin capon is not as good as an ordinary chicken, because if not large or a proper capon they are not wanted as capons or chickens either. Leave feathers on neck from head down two-thirds way to the shoulders. Leave feathers on two first joints of wings. Leave feathers on tail and half way up the back. Leave feathers on legs from knee joint two-thirds up the hips. All the rest of the feathers come off. Feathers that are removed should be saved and will sell if kept dry and clean. Be careful and keep the capon clean. Wrap paper around head. Appearances add to the sale and of course price.

DRESSING AND SELLING CAPONS

By F. H. Valentine, New Jersey

The demand, consequently the market for capons, is a peculiar one. While there is a very limited demand during the entire year, the bulk of them are sold between the holidays and spring. The turkey holds the place of honor at Thanksgiving, divides it with ducks and geese at Christmas and New Year's, and when these are past, there is more inquiry for capons, which continues till April or May. So little call is there for them outside of this season, that many, if not all dealers, cease quoting prices at other times.

The profit in capons is a mooted question. It will not pay to perform the operation on any but the larger breeds, and there are many individuals and many localities where it will not pay at all. While good capons usually sell for somewhat higher prices than

roasting chickens, the difference in price between the two is less than formerly. In Boston, it is said that the larger part of the capons are dressed clean, and sold as "south shore roasters." A capon must be fed for so long a time before marketing that the feed bill eats up a large part of the extra price.

Many poultrymen say that there is more profit in keeping pullets for eggs in the space that would be occupied by capons. But locality and circumstance must decide this point. A poor capon will bring no more than a chicken. The small sizes of capons, about five or six pounds, sell quite readily, but at lower prices. The large ones, weighing nine, ten and twelve pounds, or even more, bring higher prices per pound. They take the place of turkeys to a considerable extent.

The methods of dressing vary somewhat for different markets, and it is wise for the grower to learn from the dealer or commission merchant in the market to which he purposes shipping as to any special demands. They are usually, and always for best markets, dry picked. It is customary with most growers to leave on the feathers of the neck, tail and wings; some leave on more than others, but the carcass must show up its plump proportions and rich yellow color. For they must be well fattened. Sometimes I have seen capons in market, which were well grown and fattened, but which had been scalded, badly dressed, feathers all off, and which sold for no more than the same grade of chickens. A little extra care in dressing and packing would have paid handsomely. Dry picking is something that it seems impossible to teach except by actual practice. In short, it is a sort of knack with some people.

Having them well dressed and thoroughly cooled, packing for shipment is important. Attractive appearance must be secured. Much of the poultry sent to

market is packed in barrels, but neat boxes are much better. A box that holds a dozen large capons is a very good size. They should be packed breasts up, heads tucked under out of sight, in nice, even rows, so that when the cover is removed, they may present an attractive appearance. This goes a long way toward making a sale, and at good prices, too. The cover should be marked with the name of the contents, the name of the consignor and consignee, and the gross and net weight, though for obvious reasons, most consignees weigh all poultry received, unless it may be from some well-known shipper in whom they have learned from experience to place the utmost confidence.

I have said nothing about the manner of killing, but suppose every poultryman knows that the only way for the present-day markets is by sticking in the mouth. Fowls must be well bled, as this improves the appearance of the flesh. Crops must be completely empty when the birds are killed. Nearly all markets require birds to have heads and feet on, and to be undrawn. Formerly, Boston required them drawn, but that ordinance is no longer in force. During the capon season, the weather is usually such that no ice is required to keep in good condition, but if shipments be made during warm weather, icing will be necessary. Large, plump, well-fattened, neatly-dressed, attractively-packed birds fill choicest market requirements, and bring satisfactory prices.

CHAPTER VII

THE ART OF POULTRY FATTENING

BY H. E. MOSS, NEW YORK

THE commercial or utility side of the poultry industry, while it has always been the moving power that drives the wheels of fancy, has now reached a stage in this country that will mark an epoch in its evolution. A new era has dawned. New forces are at work and they are powerful and capable of creating a revolution in methods. And this force once applied cannot do otherwise than succeed. This power is the great packing houses of the west: the Swifts, Armours and others whose facilities for buying, slaughtering and selling meat food products to the world are of such magnitude and their system so perfect that not a city, town or village in this, and but few in foreign countries, in which their products are not sold or their influence felt. To these great establishments and not to the producers themselves are we indebted for the new conditions.

More than seven years ago one of them stated to the writer that nothing would please them more than to be able to enter foreign markets, not with better, but only as good poultry as those markets afforded. The reason it could not be done was because the American people have always set up as their standard of perfection a fat carcass, yellow and plump, without regard to what that plumpness consisted of, the only material known to them to produce it being corn, and the result from feeding it being grease or fat deposited in layers under the skin and a pound or more in the abdominal cavity; the flesh being inferior, often stringy and tough, and that poultry in this condition

would be almost unsalable in European markets. The American people with their reckless extravagance are willing to pay high prices for such poultry because it is the plumpest and best looking the markets afford, and when the meat is separated from the grease in trussing and cooking we are left but little edible portion, and that not of the best quality, deluding ourselves with the belief that we are eating a delicious morsel simply because we paid a high price for it.

No such extravagance is tolerated in any other country; poultry to many there is a luxury rarely afforded. Under such conditions we can readily understand why a fowl must be finished for market with the largest possible percentage attainable of edible portion as compared to bones and offal; furthermore, the texture of the skin, shape, appearance and firmness of flesh to the touch, and entire absence of layers of fat in the dressed bird, and the white, juicy, finely flavored qualities when cooked are the points of excellence. In order to attain this a system of feeding for specific results became necessary. Instead of turning the birds loose to range at will and shoveling out corn to them, they confine them, limiting the exercise to small coops, and feed them on material that produces these results. The method of feeding varies in manner and material in different countries.

The most successful and profitable poultry finishing locality perhaps in the world is Le Mans in Normandy. It is not uncommon for choice specimens to sell for twenty and twenty-five francs (four to five dollars) in the Paris markets and not over six pounds in weight. Such prices, however, are not obtainable outside of France, where their system of cooking and serving is so different from ours, making it possible for one fowl to serve three times as many persons as in any other country.

The next most profitable district is the counties of Surrey, Sussex and Kent, England, where whole families are engaged in it, as were their ancestors for generations back. They know nothing else, they never have done and their children never will do anything else but fatten poultry for the London market. The method employed is both trough feeding and the cramming machine, some using one, some the other, and many a combination of the two. The trough alone is not so profitable but enables more fowls to be kept in process. Ten days of trough and ten machine feeding is more profitable, but the best results are obtained by machine feeding from start to finish, care being taken to not overfeed during the first week, gradually getting them up to full feed. These results are secured through the ability of the bird to digest and assimilate two or three times as much feed as it would consume from a trough if left to its own inclination. The food is made semi-liquid and no water or grit is given in addition to it, but it must be ground to a meal and be composed of just such material as will produce these results without sickening or injuring the bird. By this method they are able to add three or more pounds of meat to a four-pound bird in twenty-one days at what would be in this country a cost in feed of about eight cents per bird for the twenty-one days, and in turn make a profit not only on the weight gained but an increase per pound for quality and finish; the perfectly finished bird having what fat it carries deposited in globules throughout the tissue, rendering it of that superior quality demanded.

If these "fatters," as they are called, are able to buy the ten to twelve-weeks-old Irish birds sent over for this purpose at seventy-five cents each, pay the enormous prices they are compelled to for feed and sell their products at a profit, what is to prevent Americans

not only sending such birds to the English markets, but from supplying their own with this most desirable meat? Mr. Charles W. Armour, the head of the Armour packing company, in an interview on this subject published in the Kansas City Star of December 1, 1901, stated that "the American people will pay more for good food than any other people in the world." This is a significant statement from a man engaged in supplying the world with meat food. All that the American people need is a taste of this kind of poultry and the demand will exceed the supply.

When this demand sets in there will be a wide divergence in price between the thin and the finished stock. The best will go higher, the poor lower. While the thin chicken will always find a sale at some price to the fatters, the greasy ones will go begging for buyers.

Canada has for several years been developing rapidly along this line. England naturally looks to her colonies first for what she needs and they are prompt to act on any suggestions from the mother country, and foster such industries as are susceptible of development on their soil. At Ottawa, Ont., Truro, N. S., and Bondville, Que., the fattening of poultry for the London market is carried on extensively under government supervision, and they have standing orders for greater quantities than they can possibly supply.

The climate of England is somewhat unsuited to poultry culture, being exceedingly damp and wet. Large poultry farms such as exist in this country are unknown there. While I believe it possible for those schooled in our methods of artificial incubation, brooding and rearing to adapt these methods to English climate and conditions, it remains to be done. There is no limit to the quantity this country can produce. We can supply every demand the foreign and home markets

impose upon us. If we can produce a good article the world wants it, but it will not do for us to try to force them to accept our false standard of excellence as theirs, at the same time knowing in our hearts that ours is not the proper, but simply a convenient one. We supply the world with the best beef; we finish our cattle up to the highest degree of perfection, and the quality governs the price. If we had refused to do so and tried to sell Europe our grass-fed steers and insisted that such were the best we could produce, they would have none of it, and our home market would be our only outlet.

The reader may form some idea as to the quality and appearance of the best dressed poultry produced in England by the following. At the Smithfield (London) table poultry show held in December, 1901, the first prize winners shown and weighed in couples were:

Buff Orpington pullets, 21 pounds 4 ounces; Dorking cockerels, 20 pounds 8 ounces; farmyard cockerels, 23 pounds 13 ounces; farmyard pullets, 17 pounds 10 ounces; Pekin ducks, 15 pounds 3 ounces; turkey cocks, 59 pounds 3 ounces; turkey hens, 49 pounds 10 ounces.

There is nothing in the above that we cannot duplicate and even excel in weight and quality. We have only to adapt the necessary methods. The cramming machine produces the maximum results, but trough feeding will add from two and one-half to three pounds of flesh to a four-pound bird in twenty-one days by the use of proper feed, which of course is the foundation. A live three-pound pullet as it comes from the farm carries about six ounces of bone, twenty-one ounces of offal, and after cooking about eighteen ounces of edible meat. Here the percentage of waste to edible portion is excessive. The bird is now in its best con-

dition to take on flesh, but the farmer, unmindful of this opportunity to convert feed into meat, rushes her off to market. The middleman steps in here and with but few dollars invested in capital, no risks incident to the production and maturing of the bird, takes advantage of the situation and the grower's indifference or ignorance, and in three weeks makes more than double the profit on a bird than the man did who raised it. He skims the cream.

The following market quotations clipped from the Kansas City Star for December 6, 1901, perhaps tell the story more forcibly than we can; for after all the hard cash is the best argument:

"Poultry—Exchange quotations, hens, alive 5 1-2c; roosters, young, 20c; old, 15c each; springs, 6 1-2c; ducks, 6c; geese, 4c; turkeys, hens, 5c young; weighing over 7 lbs., 6c; young gobblers, 5c; culls, 5c; pigeons, 50c dozen; squabs, per dozen, $1.25 and $2; dressed poultry, choice scalded stock in good condition brings 1c above live poultry prices."

From an adjoining column on the same page we clip the following:

"Specially fattened chickens; a toothsome meat particularly adapted to this season of the year. The newest offerings in poultry to be found on the market are especially fattened chickens which a local packing house is offering its patrons. Besides being unusually tender all the meat is as white as the breast. While these chickens have been fattened primarily for the English trade, their popularity is likely to become as widespread at home as abroad. Like all choice morsels they sell at high prices. A pound costs eighteen cents, in the shops, and buyers are offered their preference of either dry-picked or scalded stock."

What reason or excuse can be advanced that will justify the producer in selling his pullets (springs) at

six and one-half cents, less express and commission charges, when if properly finished they will fetch him at least double per pound. Not theoretically or on paper, but in fact as it exists to-day. He would never dream of selling an unfattened steer or hog for slaughter because the opportunity is his to convert grain into meat at a profit. He takes advantage of this slower and more expensive method but ignores the quicker and more profitable one. His eyes are being opened, however, and the true situation is becoming apparent. The revolution is at hand, and when the American people undertake it aright they will show the foreigner a clean pair of heels in this as we have in many other lines. The business has already assumed large proportions in the west. The Armours at Kansas City alone are killing 10,000 fowls a day and they are but one among those now engaged in it. They predict that in two years they will be killing twenty times this number daily. If the home markets will not consume them the foreign will. There could not possibly be a greater stimulant to the poultry industry than these big establishments have injected into it, and the time is close at hand when cramming machines may be as common as churns. We already make a better and cheaper machine than the English. In the meantime let the cry go forth: "Better poultry and more of it."

The chief requirements for profitable and successful fattening are simple and easily obtainable. First is proper feed, of which ground oats is always the basis. I know of no better mixture than 100 pounds ground oats (with hulls sifted out), ten pounds corn meal, five pounds clover meal, five pounds blood meal and one pound salt. A suitable shed or building is required that can be well ventilated and darkened, and if it can be kept at a temperature of about sixty degrees, the greatest economy in feed and most rapid gain in flesh

will result. For best results, a cramming machine is indispensable during the last ten days, as the birds will not eat half as much as they are capable of digesting and assimilating at this time. With the machine we insist upon and control the question of gain, instead of leaving it to their uncertain and well-satisfied appetites.

The above formula is the best I know of for producing the finest quality of meat and a white finish. If a yellow finish is desired, the corn meal can be increased and the ground oats decreased up to equal parts, but the birds do not stand up nearly so well under it. They also become irritable and indulge in feather pulling and quarreling. When fed in troughs the above materials, after having been thoroughly mixed dry, a suitable quantity is stirred into sour skimmilk or buttermilk, and made just stiff enough to not run. For machine feeding it is mixed to the consistency of cream. In the latter case the fowls need no water, as there is sufficient liquid in the mixture, but in trough feeding give them coarse sand for grit three times a week and water to drink twice daily.

Neither water nor sweet skimmilk will take the place of sour milk or buttermilk in the feed. It would cause bowel disorder unless an abundance of green food were fed with the sweet milk, which would make it safer, but this would be troublesome and unsatisfactory. Water will not answer at all.

THE STOCK TO USE

The most desirable birds for fattening are Plymouth Rocks, Wyandottes or Orpingtons. A cross of Light Brahma with Rocks or Wyandottes also makes a very desirable bird and finishes very nicely, taking on flesh rapidly and making a fine appearance on the stalls. The common mixed stock as it comes from the

farms does very well, especially when the American breeds predominate. They should be cooped when between three and four months old with the framework nearly grown.

The cockerels should be taken before they crow. It is a slow and uncertain task to undertake to fatten matured males profitably, and with matured females there will be some of them that will begin laying instead of taking on flesh, especially if in good flesh when put in. There is nothing difficult or uncertain in the business. It is simply one of turning feed into meat. It requires good judgment and a knowledge of the requirements and habits of the bird or animal we undertake to fatten, and a little experience teaches us how to get the greatest gain in the shortest time. The markets are ready for the product as soon as finished, and prices are always such as justify the attempt to produce meat of this quality.

ARTIFICIAL POULTRY FATTENING

By W. H. Allen, Jr., Massachusetts

The market requirements in regard to dressed poultry are more exacting to-day than ever before. This is not only true with poultry, but the same conditions exist with cattle, sheep and hogs. A well-fleshed product not only weighs more, but brings more per pound, and in the case of poultry, the difference sometimes amounts to ten cents per pound. It is possible in a lot of chickens to have some that are in very good flesh, but how to have them all well fleshed and able to command the top price, is something that has been sought for a long time.

Increased Use of Machines—That fattening by cramming fulfills this purpose must be readily acknowledged by the large number of cramming machines in use to-day. There is a party in Ohio who uses twelve

cramming machines, fattening some 20,000 fowls every month. In this connection, I might state that previously this party ran thirty incubators, raising thousands of chickens yearly, besides producing thousands of dozens of eggs for the market yearly. But he has found so much money in fattening by cramming that he has given up raising poultry and eggs for the market, and his thirty incubators are idle and for sale. There is a party also in Iowa using twenty-two cramming machines—a party in Illinois who fattens on a very large scale, fattening thousands yearly, a party who supplies the White Star line with poultry fattened by cramming, and they take all he can supply. The Armour packing company of Davenport, Ia., has a contract for 500,000 hand-crammed poultry.

The greatest industry of Clarinda, Ia., is fattening chickens for the London market. At the central station here butter, eggs and poultry are received from a radius of seventy-five miles and to the value of $2,000,000 annually. This company is the oldest in Iowa, and has other stations at Keokuk, Burlington and elsewhere, handling between $5,000,000 and $6,000,000 worth of dairy and poultry products each year. The feeding house at Clarinda accommodates about 7500 chickens which are fattened by cramming appliances.

Advantage of Special Methods—By this means the weight of the chicken is increased from thirty-five to fifty per cent. The flavor of the meat is much improved and the selling value greatly advanced. The process of fattening is not secret, as has been represented. The Clarinda poultry company is anxious to teach the farmers how to do it in order that they may improve the value of their chickens by proper food and care. They do the same thing with steers and hogs, and there is no reason why they should not fatten their chickens. The feeding machine will eventually be a common

adjunct with poultry raisers, because the one who does use it will produce so much better birds than the one who doesn't use it that the one who does not employ the machine will see that to command the price for the birds of the one who does use it, he must use it himself. The reason for this is the almighty dollar; in other words, "results."

When chickens, especially cockerels, run at large, while their appetites are good they lead too gay and active a life to lay on much flesh. If they are cooped up and fed from troughs they may eat a little, but they are not active enough to create much of an appetite, and as they have previously led an active life they are not contented at being confined, consequently they eat little comparatively. In other words, they have not appetite enough to eat all the system can assimilate. Now when the cramming machine is used it matters not whether the bird has an appetite. That bird is fed all it can possibly assimilate. The food should be so prepared that the fowl can assimilate it with the least possible exertion on the part of the digestive organs. When this is done the bird has assimilated so much more food than when fed otherwise that it is in much more flesh and commands much better price. It leaves a profit that well repays for the extra work of feeding each bird by machine.

The birds will stand this high feeding for a certain time, which is between two and four weeks, and take on a surprising amount of flesh. But there comes a time, if kept up, when the reaction seems to set in, and the trick is to get those birds off to market before that time or before the reaction has set in so far as to have done any harm. This is generally known and understood when ducks are fattened in large quantities. By a little experience one can master the process and would not then think of being without a cramming machine.

Cooping and Care—In fattening put each bird in a stall by itself, as shown in Figure 9. Several can be put together and good results obtained, but eventually one will learn that it is much more satisfactory to have each bird in a stall by itself. Do not build the coops stationary, but of a size easy to handle, for when stationary it requires too much time to whitewash, which should be done after each lot is taken out. The best and cheapest coop is made of laths nailed on to a frame, being four feet long, seventeen inches high, eighteen inches wide. On the bottom nail two or three laths, leaving a space of one inch between laths. This will leave a space both back and front of bottom for droppings to go through, and so keep the coop clean. This space must be left both back and front of the bottom, as a bird will turn around so long as it can get its head up. These coops can be set up from the floor and the droppings scraped up from the floor. But if space is to be economized, pieces a little longer than the hight of the coop should be nailed on to the four corners to serve as legs. Then a tray can be put under each coop and coops put on top of each other three or four high. The coop will keep clean, and by cleaning the trays out every two or three days, the air in the room will keep sweet. Gypsum or land plaster is a good disinfectant, and it is well to sprinkle the bottom of the trays with it after they have been cleaned out. To whitewash make a trough a little larger than the coop, put about ten inches of whitewash in it. Put in coop, turn over, and the job is done.

How to Feed—Wheel the cramming machine up to the coop in which are the birds to be fed. Take the bird in the left hand, holding its feet and flight feathers of the wings in the same hand, stretch out the neck and push onto the feed tube of cramming machine, being sure end of tube is in crop. Keep the fingers of

Fig. 9—INDIVIDUAL COOPS

the right hand on crop and press the treadle with the foot. At first, feed the bird lightly. After a few days the crop can be filled full. See Figure 10, which shows several cramming machines in a large plant. Several types of cramming machines are shown in Figures 11, 12 and 13.

As to the feed, some use one thing, some another, but do not feed too much corn meal. Be sure to use pulverized charcoal in the feed, about three pounds to 100 pounds of feed. It is a peculiar characteristic of fowls that they can assimilate a large amount of fat, and this point should not be overlooked when very best results are desired. The food should be mixed to a consistency of thick cream, and to be sure the food is all right take note of the droppings. They should not be watery, but of a consistency to hold together. If the fowls have been fed right, it will be noted that they gain most during the second week.

The main points in fattening by cramming are to watch your birds and know the amount of food to give. It is well to slightly ferment the food before feeding. This may be done by mixing the food up twelve to twenty-four hours before feeding. If the weather is cool the food should be put in a warm place.

Figuring the Profit—The difference between fattening fowls by cooping and feeding by trough and feeding by cramming is the extra weight of flesh that is put on. Aside from the fact that a good many birds actually lose flesh when cooped and fed from troughs, those that do well do not gain nearly so much as those fed by machine. Now the cost of time of feeding in trough is less than when the machine is used, but the cost of time when fed by machine is not over three and one-half cents per bird for three weeks. If the bird fed by cramming machine weighs four pounds at start of feeding, it should weigh six pounds after fat-

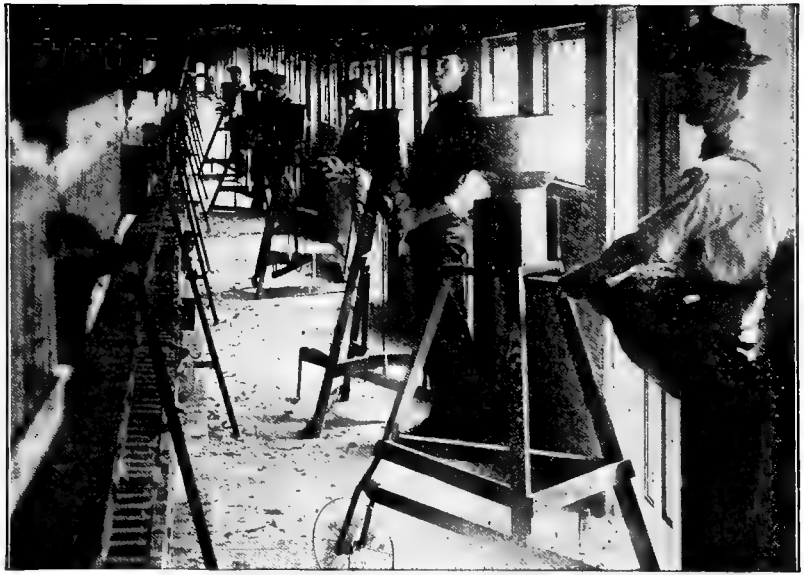

Fig. 10—CRAMMING FOWLS IN A LARGE PLANT

tened. But after fattened it would sell for at least four cents more per pound than before fattened. In the first instance at twelve cents per pound, forty-eight cents; in the second ninety-six cents; but cost of feed for three weeks is twelve and one-half cents, cost of time three and one-half cents, leaving a net profit of thirty-two cents.

It is but the difference between actual cost and selling price that must be considered in business, and this is the real reason why the cramming machine is of such benefit to poultrymen.

I started fattening by cramming, because I had known from many years' experience that much of my market poultry was not in condition to command the highest price. Furthermore, a market poultryman who was in a position to know told me that if one could fatten poultry successfully by cramming, there was more money in that line than in any other, as there was always a dearth of fancy poultry in the market. I finally started to make a cramming machine, but had no literature on the subject, nor anything to go by. From a coffee pot and a baking powder can, I rigged up a reservoir and cylinder for holding feed. A spout was soldered to the can and a stout wire with a cap used for a plunger. This was connected to a foot lever forcing out the feed.

I constructed a coop with the front and partitions of wire, divided into seven stalls, and put in seven birds. These were fed on one-third bran and two-thirds coarse corn meal, but they did not gain in weight. The pump broke many times, and it was changed this way and that until finally perfected. It took longer to feed these seven birds than it does now to feed 200.

Before the next lot of birds was put in, the coops were changed somewhat, and the windows darkened. I got the pump to working better, but had to stop and

Fig. 11—AMERICAN POULTRY CRAMMING MACHINE

Fig. 12—AN ENGLISH FEEDING MACHINE

fill it for about every third bird. When I had finished the lot, some were heavier than when originally put in, and some were not. For the third lot, I bought bolted corn meal where previously I had used common coarse meal, and to the mixture of one-third bran and two-thirds meal, I added a little charcoal. To my surprise, the birds did much better than before. In fact, they all gained, though some of them precious little. Of the twenty-one birds, I lost seven. I was so anxious to give them a square meal that I not only filled the crop, but the windpipe also.

I made more coops and kept at it, for the market-men gave me great encouragement in the way of prices for those I fattened, and I saw the good dollar ahead if once I could cut out the loss. I kept losing birds, but at length I awoke to the fact that I was feeding each bird the same amount of food. So I changed about, and gauged the amount of feed by feeling of the crop. The percentage of loss decreased perceptibly, and by constant patience and untiring energy I gradually lessened that loss so that to-day it is about nothing; in fact, with most lots, none at all, and in cases where they do die it is a bird that was sickly at time of cooping up. I now make better than $30 on each 100 birds fattening three weeks. I have had lots of birds gain three pounds or more, and the greater number two pounds, the first two weeks. The birds never look more healthy than when they are ready for market. Their feathers are sleek, their combs red, their eyes bright, and they are well filled out. They generally bring six cents per pound more than other chickens.

With regard to the coops, it took but one lot to convince me that there should be a part of the bottom left off at the back for the droppings to go through, otherwise it made an unsightly mess. I have the coops

so arranged that a great deal of time is saved in feeding. I usually feed from 225 to 250 per hour, but I have on occasion fed 330. The coops are on legs with a tray

Fig. 13—CANADIAN FEEDING MACHINE IN OPERATION

underneath to catch the droppings, and in that way I put them three high and economize much floor space. The front is so arranged that when the lath is pushed up it stays there, and after I put the bird back, give the lath a gentle tap and it drops in place.

CHAPTER VIII

LESSONS FROM FOREIGN EXPERTS

BY EDWARD R. BROWN

THERE are approved methods for fattening, viz.: (1) from the trough, (2) by hand, (3) by funnel, and (4) by machine. The first system has already been referred to, and is chiefly employed for the production of half-fattened specimens, which may either be kept in the ordinary pens or in a house and run, which can be moved on fresh ground as often as is necessary. It is fitted with troughs at either side. One of these appliances, six feet long by three feet wide, is large enough for a dozen birds, and is a suitable form for ordinary farmers. In Belgium the famous Coucou de Malines are fattened entirely from troughs, they are kept in closely covered sheds during the entire process.

Hand Feeding—Some of the finest fowls which are produced both in England and France are crammed by hand; but the process is slow, so that it is only suitable where labor is abundant and cheap. In a large establishment it would be impossible to get through the work if hand cramming were depended upon. The food is mixed to a thick paste, and formed into pellets or boluses about three-fourths inch long and one-half inch thick. There are two ways in which feeding takes place. In one a number of pellets are prepared, the operator takes hold of the bird's head, gripping it between his body and left arm, opens the mouth with the thumb of his left hand, dips the pellet into whey or milk, inserts it in the mouth and presses it down the throat with his finger, and then carries the food

into the crop by running his thumb and finger down the outside of the gullet. The second plan varies somewhat. The operator sits upon a stool, with a lot of paste and a bowl of milk or whey before him. The bird is placed upon his knees, its legs held firmly by them, the left hand holding the wings, and he places a small quantity of food, after dipping it in the milk, into its mouth, allowing it to swallow in the usual manner, there being no actual cramming. Both of these methods are very simple. In some instances a combination of these two methods is adopted. The birds are kept in cages, to which are fitted troughs.

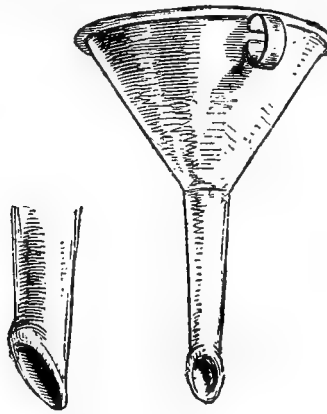

Fig. 14—FUNNEL FOR CRAMMING

After each meal the attendant goes round, feels the crop of each fowl, and crams a few of the pellets when it is thought necessary to do so.

Cramming by funnel is largely carried on in southern Normandy. In this case the food is made into liquid form about the consistency of cream. A specially made funnel, the nozzle of which is carefully turned to prevent injury to the bird's throat, is inserted into the

gullet until the orifice enters the crop, which can be felt by the finger, and the food is spooned therein until the crop is full, when the funnel is withdrawn. In operation the process requires a much shorter time than it takes to describe, but care must be taken, or there is danger of choking the fowl. These funnels, Figure 14, can be purchased at a reasonable price, and splendid quality of flesh is produced in this manner.

Cramming by machines is found to be most expeditious, and the first cost is speedily saved in the labor bill. An expert operator can feed as many as 250 birds an hour, so that the duration of the insertion is very short. Many have the idea that this system is a cruel one, but it is not. A careless or inexpert operator can hurt the subject, but it does not pay him to do so, as any injury to the throat or mouth would cause inflammation to set in and the bird would die. The tube which is passed down the throat is of india rubber, flexible, and as the cartilaginous rings of the neck are flexible, it enters quite easily. The way in which the fowls anticipate the feeding time, after the first two or three days, shows how they regard the operation. The machine largely used, shown in Figure 12, has a horizontal cylinder, and is operated by a foot lever. *A* is the reservoir for the food; *B*, the pump cylinder; *E*, the piston rod; *G*, the spring foot pedal and piston back again; *K*, nozzle and food tube; *M*, stop for regulating quantity of food; *O*, lever and treadle. For use in these machines the food is made semi-liquid, about the consistency of very thick cream, which is placed in the reservoir. The operator moistens the tube with milk to make it pass easily, takes the tube in his right hand, the bird's head in the left, the bird itself being held firmly under the left arm. Then with the assistance of the finger and thumb of the right hand he opens the bird's mouth, and slips the fore-

finger into it to hold down the tongue, quickly inserts the end of the tube, and, holding the neck perfectly straight at its full length, pushes it down four or five inches, according to the size of the bird. At this moment the heel of the right foot, which up to this time has been resting on the treadle, is depressed and forces the contents of the cylinder into the crop until it is sufficiently charged. When the crop is full enough, the tube is withdrawn, care being taken to relieve the pressure on the treadle for a second or two before taking

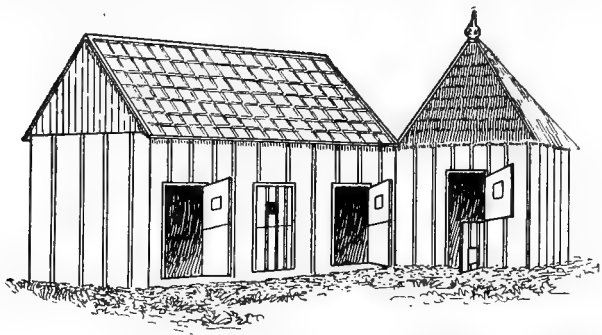

Fig. 15—FRENCH FATTENING AND KILLING SHEDS

the tube out, otherwise a small quantity of the food will continue to flow after the tube is removed. The quantity of the food can be regulated to a nicety, and the great thing is to cease pressure the moment sufficient has been placed in the crop.

The most important point in connection with fattening poultry is to give the food regularly, and if there is any remaining in the crop from the previous meal not to give any at all. Several of the French cramming machines are for liquid food, and attached to them is a piece of india rubber tubing, fitted with a spring tap or nozzle, so that the birds can be fed

in pens without taking them out, the liquid flowing when the spring is released. In this case the nozzle only is placed in the mouth, not pressed down the throat. The head must be held well up and the neck stretched to allow of easy swallowing.

French Methods—Without exception, the food in France is always prepared from finely ground meal, hard corn never being employed. Buckwheat meal, maize meal and barley meal are used. With one or other of these is used skimmilk, but in several districts of France the whey of curdled milk is preferred, and in the La Bresse country the latter is thought to give better perfection in fattening and improve the quality of the flesh. Some of the fatteners are content to mix hot water with the meal, but all acknowledge that milk or whey is better. In some cases, boiled potatoes are mixed with the food. In some parts of France, fat is mixed with the food. It is customary when the older birds are to be fattened to divide them in accordance with their sex and kind. See Figure 15 for illustration of fattening and killing sheds.

English Chicken Fattening—In England a number of people make a business of fattening chicks for the market. These chicks are bought of farmers when weighing three to four pounds and then prepared for market. Professor Robertson, commissioner of agriculture for Canada, thus describes a visit to a chicken fattener in Sussex, England: He began life as a farm laborer and is now doing a prosperous business. I would not like to say how much the fattening business brought him in, but I should not be surprised to learn that his annual net income was about $5000.

He has on an average 4800 chicks fattening at his place. In approaching the house I went down a lane, lined on both sides with coops in which there were chicks. Other coops were placed about the place. The

special buildings required for this purpose are very cheap affairs and not at all large. Two-thirds of the fattening is done in the open air. He rears only a small portion of the chicks which he fattens, and has a man who goes around on certain routes every two weeks, collecting chicks from farmers, who raise them to about three and one-half pounds live weight.

The coops in which the chicks are put for fattening are about six and one-half feet long, sixteen inches wide and sixteen inches high inside. Each coop is divided into three compartments and in each one of these are put

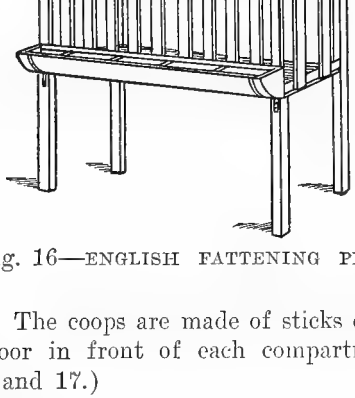

Fig. 16—ENGLISH FATTENING PEN

five chicks. The coops are made of sticks or rods with a sliding door in front of each compartment. (See Figures 16 and 17.)

The chicks are fed about three weeks, but sometimes longer or less, according to their condition when received, and the activity or dullness of the market. They are fed on oats ground very fine, the hulls being pulverized until they are almost like dust. This is mixed with skimmilk, either sweet or sour, but preferably sour, to a consistency of thin porridge, so that it will drop but not run off the end of the spoon. It

is usually fed raw in a V-shaped wooden trough placed in front of each coop. The chicks are fed a small amount of this three times a day at first. They are kept hungry for the first week and after this are fed twice a day as much as they will eat. During the last ten days a small quantity of tallow is added to the mixture. This is melted and mixed with a small portion of meal, when it will mix readily with the bulk of the feed. A pound of tallow to seventy chicks is given at the beginning of the ten days' feeding and gradually increased to one pound to fifty chicks.

Summary of English Methods—The following rules have been drafted by one of the most successful south-country fatters:

In fattening fowls, the actual amount of food supplied goes only a little way in the production of flesh as compared with the conditions under which the birds are kept.

There is a difference in the readiness in which fowls fatten, even of the same variety. Large framed birds, well grown, produce the finest specimens.

Where first quality birds are to be turned out, those selected should be placed in a large outside run, and for the first three or four weeks fed on no more than one meal a day. They are then removed to the pens, and the food gradually increased in quantity until they have as much as they can eat, when they are finally finished off by cramming, as already described, this last stage occupying three weeks. The object of the treatment is to gradually build up the flesh upon the frame. It is not suitable for young chickens, which are fed right off, and is not usual for ordinary fowls.

When cramming commences, each bird should be placed in a separate pen, or two to six together in larger compartments, if of the same age and sex, in a quiet, sweet, and if possible, rather dark room or shed,

and for the first few days be fed from a trough, finishing off by the crammer.

Before a bird is crammed, the crop should be felt, and if there remains any food in it from the previous meal, no food is given until the next time of feeding. Observations should be made as to the quantity assimilated, so as to give a fowl each time as near as possible just about as much as it can digest. Should a bird show any sign of sickness, it should be placed in an open run for twenty-four hours without food. To aid digestion, grit may be given in a dish before each pen, and boiled nettles mixed with the food two or three

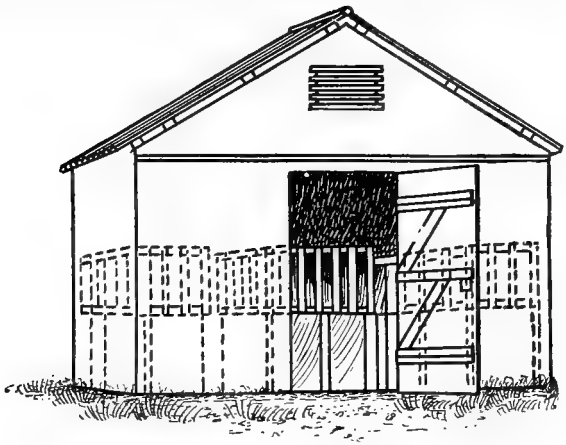

Fig. 17—ENGLISH FATTENING SHED

times a week as an aid in keeping the blood cool. Young chickens may be fed three times a day, but for older birds twice a day is much to be preferred.

It is customary in England to give a small quantity of fat during the latter stages of the process, and this is found to give a softness to the flesh which is very desirable, but the amount should not be large, or the

grossly fattened specimens which are so objectionable will be produced. None whatever is mixed with the food whilst the fowls are being fed from the troughs, but when put onto the crammer, a quarter of an ounce should be allowed for each bird per day, or a tablespoonful for four fowls, gradually increasing it to double that quantity. Fat may be bought in barrels for this purpose ready for use, but in most of the larger towns butchers' scraps can be purchased at a cheap rate, and should be clarified and stored ready for use when required. It must, of course, be melted and thoroughly mixed with the meal and milk. It is sometimes found, especially during hot weather, necessary to keep the blood cool. A little flowers of sulphur is useful to this end, but some of the fatters boil nettles, and, after chopping, mix in the same manner.

Fowls should be fed twice each day, and at regular times. The exact hours will vary in accordance with the season of the year. In summer six o'clock in the morning and six o'clock in the evening will be the most suitable, but in winter eight in the morning and four in the afternoon will be better. In this case the evening meal should be fuller than the morning.

Routine of a German Plant—Twenty-four hours after the chicks are hatched they are moved into cages. The cages are simple, having straight lattice fronts, which vary in space between bars according to the age of the birds. Sliding doors facilitate cleaning, and the cages vary in size, for as twenty birds are kept together they need more space as they grow. Out of these cages they never go. Before them is a constant supply of food, made of maize meal and buckwheat meal mixed with milk, for several cows are kept on the farm. A little phosphate of lime is given for bone and feather formation. Each room is warmed, and yet there is a constant supply of fresh air, but it must pass around

the stove ere entering so that the birds are kept in an even temperature. Treated in such a way, many chickens are ready for killing at six weeks old, while all meet their fate ere they attain two months. At this latter age many weigh three pounds each, and the prices per pound vary from twenty-two to thirty cents, according to the season. They are killed on the spot and dispatched in various ways. The German parcels post being cheap tends to develop business. In summer ice is used for packing. In 1890 9000 chicks were reared in this manner, in addition to 1000 sold alive at two to three days old. Several hundred fat fowls of four or five months were sold, but these were reared outside and fattened in cages, on the French plan, accommodations being provided for 300 birds in another building.

Below the pens, which are made in sets of six, is a long board similar to that employed in canary cages, kept covered with earth, and the droppings fall upon this tray through the bars at the back of the floor, the latter being solid only half way in. The cages are simple in construction, having a sliding bar in front, and stand upon short legs. The food trough runs the whole length of each set of six. The cages are six feet long, one foot six inches deep and one foot nine inches high, divided into six compartments. The tray is three inches deep and slides easily in and out, the legs being carried six inches below the pen proper.

Foods Used—In Belgium finely ground buckwheat is universally used, and this gives very good results. In France buckwheat meal and fine barley meal are used very largely, both of which are very good, but by reason of the greater amount of lime in oats they certainly are the best.

With meal should be mixed sour skimmilk, buttermilk or whey free from curds. In Sussex, England,

the whey alone is adopted, and one of the largest fatters sometimes pays $100 a week for milk during the busy season. Whole milk would not only be more expensive, but the butter fat in it is not necessary, and other fat can be substituted at a much cheaper rate. Surprise is often expressed that sour rather than sweet milk should be used. In practice it is found that the former gives better results, the acid generated by the turning of either milk, buttermilk or whey causing more rapid action than would be the case if it were sweet. Not only is the milk itself soured, but when mixed with meal, as is usually done immediately after feeding is over, it is allowed to stand for several hours, until a slight fermentation has taken place. The advantage of being able to use what is often waste products is very great, and on dairy farms the skimmilk and buttermilk can be thus made of great service.

CHAPTER IX

AMERICAN FATTENING METHODS

THE big Kansas City and Chicago packing houses are going into the chicken fattening business in a wholesale manner. One of them proposes to start branch feeding establishments to collect and fatten chickens for the main concern. Lean chickens, it is claimed, can be made to gain two pounds each in two weeks at a cost of two cents per pound, while the specially fattened bird will sell for three and four cents more per pound than the unfattened one. The fattened flesh is softer, richer and also lighter in color.

At present only a part of the 10,000 fowls killed daily are specially fattened, but cage accommodations are furnished for about that number. Long rows of continuous coops are piled one on top of the other in a huge room. The chickens are kept in a dark room. Just before feeding time huge shutters which obscure the light are opened. These shutters are high on the sides of the building. The chickens, with the light turned on them, become active. Three times a day the chickens are fed and are permitted to eat for a half hour only. Long troughs run the entire length of each row of coops. The spaces between the laths are just large enough to permit the chicken to thrust his head out of them into the trough. Six chickens are confined in each coop and there is an opening for each chicken. It has been discovered that a chicken will eat twice as much if fed regularly three times a day as if permitted to feed all day long. Just as soon as the half hour's stuffing is concluded the room is once more darkened and the troughs taken down. The chickens, thoroughly satisfied, become almost dormant. For

fifteen minutes before feeding they keep up a continuous crowing. Two minutes after the feeding not a sound can be heard in the chicken department.

The food comprises a variety of grains ground very fine, cooked and fed moist. These stall-fed fowls are becoming very popular at high prices wherever offered. Experiments are being made with the machine poultry feeders as used in Europe, and an American type of the machine has been invented. But at present nearly all the fowls are pen fattened. The plan may easily be followed by small producers, the essentials being quiet and darkness except at feeding time, and plenty of soft food in variety, with regular feeding.

Progress in Canada—At the new chicken fattening stations in Canada the methods practiced are those by which the best grade of poultry is prepared for the

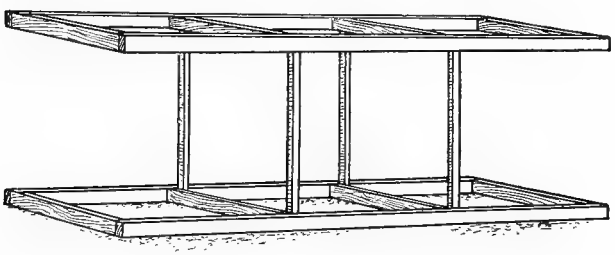

Fig. 18—FRAME OF CANADIAN FATTENING CRATE

English market, the object being to fit Canadian poultry to bring the highest prices when exported, but the product is in demand in its home market also, at advanced prices. The chickens are bought from farmers at the weight of three to three and one-half pounds live weight, choosing the breeds likely to fatten well, and with white or light yellow legs, paying for these thirty-five to sixty cents per pair.

The chickens are put in small open lattice coops and fed on ground grain, chiefly oats mixed with skimmilk. During the last part of the process they receive an allowance of tallow. Four to twelve chickens are kept in each coop. The grain is ground fine and mixed with skimmilk, sweet or sour, sour being preferred. The mixture resembles cream or thin porridge. At first, food is given three times a day for the first ten days, then twice a day. At the end of the second ten days the cramming machine is used. Tallow

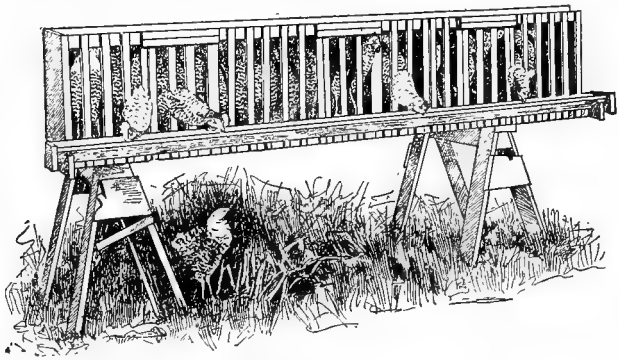

Fig. 19—TWELVE PLYMOUTH ROCK CHICKENS IN A CANADIAN FATTENING CRATE

fed during the last ten days is melted, thickened with meal and then mixed with the porridge. It is the rule not to feed at all until the crop is empty from the last meal. The cost of food in some recent experiments was 6.43 cents per pound of live weight gained.

For twenty-four hours before killing, the birds are not fed. They are bled through the mouth, plucked, but not drawn. A ring of feathers about two inches long is left at the head of each bird. They are shaped on a shaping board, cooled, wrapped in a piece of clean

brown paper, leaving the neck and head projecting at one end and the legs at the other. Shipping cases for twelve fowls are 33x19x6 1-2 inches. The financial side of one experiment foots up as follows: Cost of chickens, fifty-four cents; food, thirty-three cents; shipping cases, three cents; freight, commission, etc., eighteen cents; total cost, $1.08 per pair. They sold for $1.76 per pair.

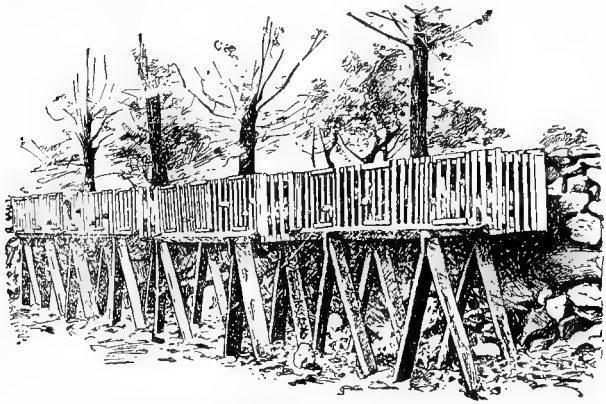

Fig. 20—CRATES OF CHICKENS FATTENING UNDER THE TREES AT BONDVILLE, QUE.

The result of the second year's work was considered on the whole much better than the result of the first at every station. The knowledge and ability can be acquired only by experience. In a locality where a station was opened, the first year the farmers had not the right sort of chickens to fatten well. Breeds of chickens like Leghorns and Minorcas do not fatten profitably. The fattening of them is like trying to fatten Jersey steers as against Shorthorn bullocks. The Plymouth Rocks and Wyandottes give far better results in fattening than the smaller breeds. At

Whitby, Ont., in 1900, were fattened 134 chickens, which cost 55.8 cents per pair. The feed was valued at $1.20 per 100 pounds for ground oats and fifteen cents per 100 pounds for skimmilk. At these rates the feed cost 22.2 cents a pair; the cost of shipping cases 2.2 cents a pair, ocean freight and cartage 7.8 cents a pair, selling commission six cents a pair, express charges in Canada from the shipping point to the seaboard

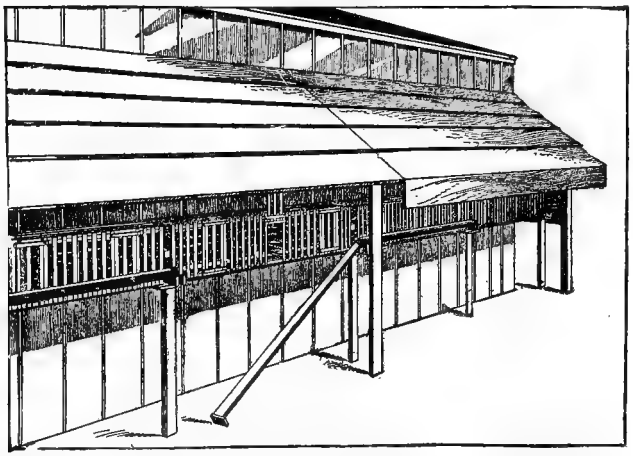

Fig. 21—FATTENING CRATES AGAINST A TIGHT FENCE WITH ROUGH BOARD SHELTER

3.6 cents a pair. The whole cost was 97.6 cents a pair, and these were sold in Manchester for $1.28, leaving thirty cents a pair for the labor and profit.

The fattening coops are made of frame and slats in a simple manner as shown by the illustrations, Figures 18, 19, 20 and 21. A coop for twelve birds is six feet long, fifteen inches square and nineteen inches high. These are kept on stands as illustrated, being placed in sheds or outdoors in a sheltered place. The

chickens are fed twice a day, the food being placed in the trough in front, and the droppings fall through the slats to the ground. Some chickens were fattened on the ground, but those in coops did better. It was found that nothing could take the place of skimmilk, which was used thick and sour about twice as much by weight as of grain. The manure was of some value, and the feathers, averaging four ounces per bird, brought seven cents per pound.

The following is the Canadian fattening experience boiled down in a practical way: The most profitable period for fattening is four weeks. Don't overfeed the first week. Remove food left over. After first week give them all they will eat. Feed twice a day. Grain should be ground very fine. Skimmilk makes flesh and whitens it. Use a little salt, and supply water and grit. Feed tallow the last ten days, mixed hot with ground grain, beginning with one pound tallow to seventy or 100 fowls and increasing to one pound for fifty to seventy. Kill lice with sulphur rubbed under wings and tail. The feeding machine will increase the gain the last ten days, but should not be used longer. Stuff only when the crop is empty.

The following in tabular form shows the results in 1900 from some of the best Canadian stations:—

Station. 30 days	No. of Fowls	Gain in Weight.		Cost of Feed.	
		Total	Average each	Total	Per Lb. Live Gain
		Lbs.	Lbs.	$ Cts.	Cts.
Whitby, Ont.	134	263	2.	13.55	5.1
" "	25	61	2.44	3.27	5.3
Bondville, Que.	50	142¼	2.85	7.96	5.6
Truro, N. S.	30	78	2.6	3.38	4.3
Alberton, P. E. I.	126	314½	2.5	16.12	5.1
Totals	365	858¾	2.35	44.28	5.27

Feeding Fowls in Yards—The results of several comprehensive trials by the Maine experiment station prove conclusively that confinement in small coops as

practiced abroad is not necessary for the best or cheapest gains. Prof. G. M. Gowell has made six group trials of close confinement as against partial liberty in fattening chickens. Different foods were also tried, but in each case they consisted of a mixture of ground grain and by-products wet up with either water or skimmilk. The trials comprised the use of thirty-five separate coops and six houses. In these lots there were fed 321 chickens of different ages in periods of twenty-one, twenty-eight and thirty-five days each. The occupants of the coops were weighed weekly to note the gain. In eleven of the coops, containing four birds each, gains were greater than in the houses and yards containing from twenty to sixty-eight birds with which they were matched. In the twenty-four other coops the gains were less than in the houses and yards with which they were similarly matched. In five of the six trials gains were greater in the houses and yards where birds had partial liberty.

The results show that close cooping is not necessary in order to secure the greatest gains in chicken fattening and that the chickens make greater gains when given a little liberty than when kept in close confinement. Not only did they make greater gain in weight but less food was required to make a pound of gain. The labor involved in caring for birds in small numbers in coops is much greater than in caring for an equal number in houses and yards. In all the trials the greatest gain was made in a feeding period of thirty-five days. Forty chicks confined in the coops gained an average of two and one-quarter pounds each, while twenty chicks of like age and condition fed in a house and yard gained two and one-half pounds each. The trials also show that the greatest and most economical gains are made with young fowls. In two trials birds which were ninety-five days old at the beginning of the

feeding period, which continued for twenty-eight days, gained twice as much as birds in other trials which were 160 days old at the beginning of the test, which in this case lasted but twenty-one days.

The main requirements for economical gain seem to be the partial confinement of young fowls and feeding them twice daily on a suitable mixture of ground feed.

Home Method—I have fattened for market this season over 100 cockerels and have settled on this method as best. They are confined two weeks in a coop or pen, given plenty of room and air, but where drafts cannot strike them. Low roosts are provided, a dust bath, though I have never seen them use it, and boxes of grit and oyster shells. I make low benches of overturned soap boxes, on which I place their pans of food and milk, that they may not readily be soiled or spilled.—[Clarissa Potter, Maine.

To Fatten Poultry Quickly—The following directions are sold by a concern which advertises them as a method to fatten poultry, especially turkeys, in "four or five days." Boiled rice is the standard remedy for bowel troubles of turkeys, but as a regular fattening ration would prove expensive compared with corn. Sometimes slightly damaged rice, rice powder, sago or tapioca can be bought cheap. "Set rice over the fire with skimmed milk, only as much as will serve once. Let it boil until the rice is quite swelled out; you may add a teaspoonful or two of sugar, but it will do well without. Feed them three times a day in common pans; give them only as much as will quite fill them, at once." The addition of sugar, molasses, tallow, etc., to the soft feed hastens fattening, but does not ordinarily pay unless these materials can be bought for about the price per pound of grain. Milk is of great value fed with soft feed, and is worth more fed to fattening fowls than to pigs or calves.

CHAPTER X

AT KILLING TIME

TOO many fowls are still dispatched by cutting off the head; a method tolerably good for home use, but with disadvantages when applied to market poultry. A fowl killed this way weighs less, loses in appearance and dry picks a great deal harder than when killed in expert manner. A bird killed in a bungling or second rate style is evidence of the beginner or amateur, and fowls so treated are quite likely to be poorly fattened and carelessly dressed and packed. In poultry marketing, as elsewhere, the money is made by those who learn the best methods from start to finish.

Yet it should be noted that in some localities and in certain markets, particularly those of small towns, the best classes of poultry are sent to market beheaded and scalded or otherwise mishandled from an expert point of view. It may not be wise for the beginner to go contrary to the best practice of his market in such details. A careful examination of the best carcasses of the various classes of poultry will show what the best trade expects. Judgment must be used. The grower who is building up a choice private trade may safely introduce changes which are improvements, but which would require some courage and push to work successfully for shipment to a large town. In some places there is considerable "missionary" work to be done, but the best methods will no doubt prevail everywhere as they become more discriminating. At present the market sections which are most careful and notional about poultry are also those where the best prices may be obtained.

Making the Cut Stunning the Bird Beginning to Pick

Fig. 22—THE DIFFERENT STEPS IN DRESSING POULTRY

In preparing poultry for market the following is the usual expert method employed: The fowl to be killed is held, with the back up, far enough under the left arm so that the neck is stretched when the arm is extended. The head being grasped in the hand, with the forefinger holding the mouth open on the under side, the knife, preferably one with a sharp narrow blade, is thrust into the mouth as far as possible, as shown in the first of the series of six illustrations prepared for this chapter by T. H. Taylor, Jr., former instructor at Rhode Island poultry school. A quick, strong cut is made up through the roof of the mouth, causing the fowl to bleed freely. The large wing and tail feathers are the first ones pulled and while the fowl is bleeding, the picker holding the bird by the wings close to the body with the head toward him, as shown in Figure 22. By this time free bleeding will have stopped. Still holding the fowl in the left hand, it is struck once or possibly twice on the head with a club to stun it and prevent fluttering in a great measure.

The picker now sits beside an open box, the top of which comes on a level with his knees. The fowl's head is thrust into an old boot leg tacked on the side of the box and is held there by the picker's knees; the wings being held between his knees. The legs are held in the left hand while he picks with his right: the breast feathers first, then the back and legs, finishing with the small wing feathers, with the exception of the first joint, which is left unpicked. While picking the fowl is always held stretched out and the feathers pulled toward the head. As they are pulled they are thrown into the box. The feathers being removed, the picker uses his knife to pull the pinfeathers, the thumb of his right hand and the blade acting as tweezers, as shown in Figure 23.

The Finished Fowl | Pinfeathering | Finishing the Feathers

Fig. 23—PICKING THE CARCASS

The finished fowl is shown at the left in Figure 23, the wings being folded back to give a symmetrical appearance. The fowl is then thrown into clean cold water to cool. After remaining about an hour in the water, it is taken out and allowed to drain, and is then ready to pack for shipment. The above method applies to ducks, geese and turkeys, except that with ducks and geese the pinfeathers are usually "shaved." Although called shaving it is more truly cutting, a sharp vegetable knife being used with a quick drawing motion to cut them off.

Turkeys are generally hung up by the feet, then stuck and the wing and tail feathers pulled, and, after being hit on the head, taken down, and the same methods employed as with fowls.

A prominent western poultryman describes a slightly different method: "In killing, hang the chicken by the legs by a slipnoose at a hight convenient for the picker, say four and one-half feet. Clasp wings between fingers of left hand, also raise head and hold between thumb and third finger of same hand, holding the beak open. Hold knife in right hand.

"The stroke of the knife, if properly made, enters the brain and also cuts large arteries. The fowl bleeds freely, closes its eyes and seems paralyzed. Picking should begin at once before the muscles jerk and stiffen. Begin with the breast, carefully if tender, to avoid tearing. Next the tail and along the back of the neck. Then the wing butts, neck and fluff. Finally clean off the remaining feathers and hand the bird to the pinfeatherers, who are usually women. By practice a fowl may be picked in less than two minutes. It is important to draw most of the feathers right after sticking in order to pluck fast and without tearing. If the skin is badly torn it should be sewed after pinfeathering.

"Fowls to be scalded are stuck more deeply and the blade twisted a little during the stroke, causing them to bleed fast and die quickly. When dead hold in nearly boiling water one minute, but keeping out the legs and head. All but the large feathers can be rubbed off in a moment, using care not to needlessly rub away the skin."

The place to cut is indicated in Figure 24, also the approved style of killing knife, although a pocket knife

Fig. 24—KNIFE AND WHERE TO CUT

of small to medium size will answer. The cut is of course made inside the mouth. On opening the bill the artery to be cut may be seen beneath the place marked *a*. Make a clean cut with the point of the blade so as to cut artery under point marked *b*. Figure 25 shows the operation, also a guide for the knife, which is a convenience where large numbers are killed. The bird here is suspended by the legs, so that the head just enters the guide. The body is first slipped into a sack made from old grain bags, to prevent flapping and bruising. For grown fowls, the bag should be about twenty inches long, ten inches wide at the larger or

top opening, gradually getting narrower until it is only five inches wide at the bottom opening. The fowl is placed in the bag head foremost. Owing to the shape of the bag, the fowl slips down to that part of the bag that fits it after the style of a legging. The head of the fowl comes through the small opening at the bottom of the bag.

Fig. 25—KILLING BAG AND KNIFE GUIDE

Killing Ducks—On one of the largest Long Island duck farms the ducks killed are arranged as follows: Two posts are planted in the ground about ten feet apart. The posts are either mortised or a notch sawed in them near the top, five feet from the ground. A rail is then spiked in these notches, and strings fastened to the rail with loops to hold the feet of the ducks. As many pegs are driven in the ground underneath the

rail to correspond with the number of strings. To these are fastened a short piece of wire, the top of which is bent in the shape of a hook, which is fastened into the duck's nose. This prevents the duck from swinging its head around and soiling its feathers with blood. In dressing, the breast feathers are removed as soon as possible. The feathers on the head, a few on the neck, the flights in the wings, and the tail feathers are left on. Duck feathers bring about forty cents per pound, which about pays for the picking.

Foreign Methods—In France there is a plan of sticking followed, which offers advantages to the inexperienced. A special knife is employed. It is fitted with a long, narrow blade, sharpened on both sides. The bird is taken, its legs tied together, and laid upon its back; the mouth is then opened with the operator's left hand, and the point of the blade inserted into the slit which will be found in the fowl's mouth. One firm, sharp cut is made right along the skull from back to front, piercing the brain most effectually. To do this properly the knife must be forced right through to the back of the skull, and the brain cut along its entire length. The bird should be hung for a few minutes to allow the blood to drain away, when plucking can take place. If the operation is properly performed death is very speedy, and there is only momentary pain. Care must be taken to cut the brain as described or the bird's death will be a slow one.

Wringing the Neck—Fowls intended for export from Canadian ports to England are killed by wringing the neck. Much of the blood flows into the parts around the head, from which it is drawn away by a small cut. The bird should be held firmly by the legs in the left hand, the head in the right between two of the fingers back of the skull, the back of the bird upward. The legs are then pressed against the left

hip, the head laid against the right thigh near the knee. Next the fowl should be rapidly and firmly extended or drawn, and at the same time the head is suddenly bent backward, by which means the neck is dislocated just below the junction with the head, and death immediately ensues, as all the large vessels are torn across.

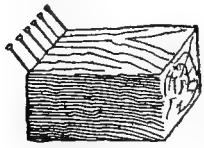

Fig. 26—BEHEADING BLOCK

If fowls are to be killed by the beheading process, a mechanical guide, as shown in Figure 26, helps in keeping the bird in position and in guiding the blow. The spikes are far enough apart to slip the head in between. One person can easily hold legs and chop head off, which is much easier than striking hit or miss.

CHAPTER XI

PREPARING FOR MARKET

AFTER raising the poultry we do not take pains enough in preparing it for market. This chapter will be devoted to an account of the standard methods in vogue for poultry intended for the large market cities.

The birds should not be fed for at least twelve hours before killing. Turkeys should be picked while warm; for best markets never scald, as it injures the sale. Pick carefully and do not bruise or tear the skin. After picking, remove the head, strip the blood from the neck and take off a portion of the neck bone. Just before packing draw the skin over the bone, tie and trim neatly.

Poultry should be entirely cold before it is packed, as it is almost sure to spoil if any animal heat remains. Even if it should not injure, its ill appearance would probably secure the condemnation of the health inspector. Turkeys should be laid straight and packed in boxes lined with clean paper. Straw should never be used, as it creases the bodies, and the chaff gives an untidy appearance. Nor should turkeys be wrapped in paper. They should be packed as closely as possible, backs upward, legs straight, so that there can be no possibility of splitting. When packed in barrels they are cramped and do not present so good an appearance when taken out. The best boxes are of good quality, clean and made to hold 100 to 200 pounds. Larger boxes are inconvenient to handle and more liable to injury.

Mark the boxes plainly. The shipper should always be strictly honest and mark the quality, gross

weight and tare exactly. Any attempt at deception will be discovered by the buyer, the commission house will have to make good all loss, and the shipper's mark will be subsequently avoided as unreliable. The address of the consignees should be plainly marked and the initials or shipping mark of the consignor. Full advices and invoices are usually sent by mail at once after the goods are shipped.

The bench shown, Figure 27, is convenient when picking and dressing fowls. It is made from a common, plain table. One pair of legs are shortened to give a moderate slope, side guards are added to hold

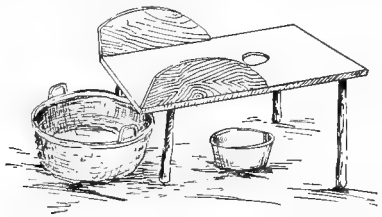

Fig. 27—TABLE FOR DRESSING FOWLS

the feathers, which are caught in the basket. A hole is made for the neck of the fowl to drip through into the dish below.

For most markets, the intestines or crop should not be "drawn." For scalding poultry, the water should be as near boiling point as possible, without actually boiling. The bird being held by the head and legs, should be immersed and lifted up and down in the water three times; this makes picking easy. When the head is immersed it turns the color of the comb and gives the eyes a shrunken appearance, which often leads buyers to think the fowl has been sick. The feathers should then be at once removed, pinfeathers and all, very cleanly and without breaking the skin.

It should next be "plumped" by being dipped about ten seconds in water nearly or quite boiling hot, and then at once into cold water fifteen to twenty minutes. Great care should be taken to avoid bruising or cutting the bones or flesh. It should be entirely cold and dry before packing, but not frozen. This is a matter of importance, for if packed with the animal heat in it, it will be sure to spoil. After scalding ducks and geese, wrap them in a cloth for about two minutes, when the down will roll off with the feathers. Guard against overscalding, as this will cause the skin to loosen and rub off. Underscalding is also undesirable, as the fowls are liable to become slippery during shipment.

Western Methods of Dressing—Kill by bleeding in the mouth or opening the veins in the neck; hang by the feet until properly bled; head and feet should be left on, and the intestines and crop should not be drawn. For scalding poultry, the water should be as near the boiling point as possible without actually boiling; pick the legs dry before scalding; hold by the head and legs and immerse and lift up and down three times; if the head is immersed it turns the color of the comb and gives the eyes a shrunken appearance, which leads buyers to think the fowl has been sick. The feathers and pinfeathers should be removed immediately, very cleanly, and without breaking the skin; then "plump" by dipping ten seconds in water nearly or quite boiling hot, and then immediately into cold water; hang in a cool place until the animal heat is entirely out; it should be entirely cold, but not frozen, before being packed.

Dry-picked chickens and turkeys sell best, and we advise this way of dressing, as they sell better to shippers; scalded chickens and turkeys generally are sold to the local trade. To dry-pick turkeys and chickens properly, the work should be done while the

bird is bleeding; do not wait and let the bodies get cold; dry-picking is more easily done while the bodies are warm. Be careful and do not break and tear the skin.

Pack in boxes or barrels; boxes holding 100 to 200 pounds are preferable, and pack snugly; straighten out the body and legs so that they will not arrive very much bent and twisted out of shape; fill the package as full as possible, to prevent shuffling about on the way. An ideal package of dressed poultry is shown in Figure

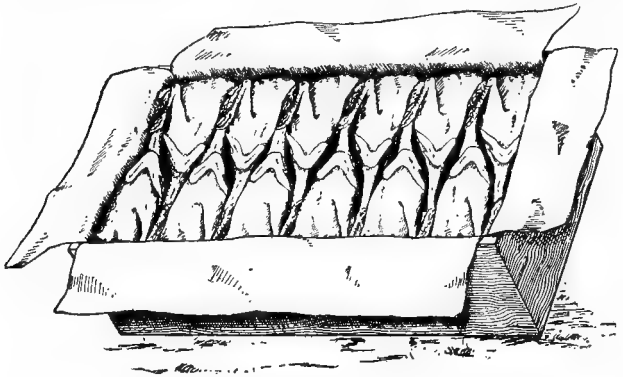

Fig. 28—DRESSED POULTRY PACKED IN THE BEST STYLE

28. Mark kind and weight and shipping directions neatly and plainly on the cover. Barrels answer better for chickens and ducks than for turkeys or geese. When convenient, avoid putting more than one kind of fowls in a package. Endeavor to market all old and heavy cocks before January 1, as after the holidays the demand is for small, round, fat hen turkeys only, old toms being sold at a discount to canners.

For geese and ducks, the water for scalding should be the same temperature as for other kinds of poultry, but it requires more time for it to penetrate and loosen

the feathers. It is a good plan after scalding to wrap them in a blanket, providing they are not left long enough to partially cook the flesh. Another method, and no doubt the best for loosening feathers, is to steam them, and, whenever proper facilities are at hand, we advise this process. It is poor policy to undertake to save the feathers dry by picking them alive just before the killing, as it causes the skin to become very much inflamed and greatly injures the sale.

Do not pick the feathers off the head, and it is well to leave them on the neck close to the head for a space of two or three inches. The feet should not be skinned, nor the bodies singed for the purpose of removing any down or hair, as the heat from the flame will cause them to look oily and bad. The process of plumping and cooling is the same as with turkeys and chickens. There is no kind of poultry harder to sell at satisfactory prices than poor, slovenly dressed geese and ducks, and those who send in such must not be disappointed at low prices. No poultry of any kind sent to the Chicago market should be drawn.

Boston Produce Exchange Instructions—In fattening for the markets, remember that you will not only get pay for every pound your poultry gains, but by improving the quality you gain from one-fourth to one-half in price on the whole. This improved quality is more likely to be gained by feeding corn than otherwise. Give them all they will eat, and your poultry will be more yellow and better than that fattened on any other grain.

Keep stock from food for twenty-four hours before killing; because food in the crop injures the appearance, is liable to sour, and consumers object to paying for this worse-than-useless weight. All poultry, but more especially turkeys, should be killed by bleeding from the neck, and picked immediately, while the body is warm.

No strangled, scalded, or wet-picked poultry will sell for more than half price. Always strip the blood out of the neck as soon as the head is taken off. The skin should then be peeled back a little and the neck bone removed in the usual way. Just before packing, draw the skin over the end of the bone remaining, and tie and trim neatly. The wing and tail feathers must be pulled out clean, and the intestines drawn through as small an incision as possible.

Be sure that poultry retains none of the animal heat when it is packed. It should be cold, but not frozen. Sort very carefully and have "No. 1" stock of uniform quality. Each quality should be in a separate box, containing not more than 200 pounds, as greater bulk is more inconvenient to handle and more liable to get damaged. Never wrap poultry in paper or pack in straw. Line the boxes with clean paper, pack closely, back upward and legs out straight. Before the cover is nailed down, see that there is no possibility of the contents shifting about. In shipping, mark kind and gross weight on the cover. The name or shipping mark of the shipper should appear thereon, as well as the address of the firm to which the package is sent. An invoice and full advices mailed as soon as the shipment is made will often save time and annoyance to both shipper and dealer.

A Chicago Dealer's Directions—In the first place, poultry should be well fed and well watered, and then kept from eighteen to twenty-four hours without food before killing. Stock dresses out brighter when well watered and adds to the appearance. Full crops injure the appearance and are liable to sour, and when this does occur correspondingly lower prices must be accepted than obtainable for choice stock. Never kill poultry by wringing the neck. To dress chickens, kill by bleeding in the mouth or opening the veins of the

neck; hang by the feet until properly bled. Leave head and feet on and do *not* remove intestines nor crop. Scalded chickens sell best to home trade, and dry-picked best to shippers, so that either manner of dressing will do if properly executed. For scalding chickens the water should be as near the boiling point as possible without boiling; pick the legs dry before scalding; hold by the head and legs and immerse and lift up and down three times; if the head is immersed it turns the color of the comb and gives the eyes a shrunken appearance, which leads buyers to think the fowl has been sick; the feathers and pinfeathers should then be removed immediately very cleanly, and without breaking the skin; then "plump" by dipping ten seconds in water nearly or quite boiling hot, and then immediately into cold water; hang in a cool place until the animal heat is entirely out of the body. To dry pick chickens properly, the work should be done while the chickens are bleeding; do not wait and let the bodies get cold. Dry picking is much more easily done while the bodies are warm. Be careful and do not break and tear the skin.

Packing and Shipping—Before packing and shipping, poultry should be thoroughly dry and cold, but not frozen; the animal heat should be entirely out of the body; pack in boxes or barrels; boxes holding 100 to 200 pounds are preferable, and pack snugly; straighten out the body and legs, so that they will not arrive very much bent and twisted out of shape; fill the packages as full as possible to prevent moving about on the way; barrels answer better for chickens and ducks than for turkeys or geese; when convenient, avoid putting more than one kind in a package, mark kind and weight of each description on the package and mark shipping directions plainly on the cover.

Icing Poultry for Shipment—On this subject a Chicago commission dealer writes: "There is but one

absolutely successful way to ship iced poultry, and that is in crushed ice. It should be shipped in barrels that are strong, with holes in the bottom. First place a layer of excelsior on the bottom of the barrel, then a layer of crushed ice. Lay the fowls neatly together and then cover them with another layer of crushed ice. Keep this up until the barrel is filled. When the top is reached, cover the last layer of fowls with an inch and a half of ice. The finer it is crushed the better. Place over this some excelsior, and over the top burlap. Poultry shipped in this way will never bruise, and arrives in the market in excellent condition. In several instances I have instructed my shippers to do this and once sent a grate bar to a heavy shipper and instructed him to pound his ice through this bar, so as to crush it. Ice crushed as is done for barrooms is the kind to use in shipping dressed poultry. The crushed ice seems to form a crust in each layer and keeps the poultry as sweet and nice as when first killed. All who follow these directions will have no trouble with iced poultry."

Shrinkage—The feathers weigh three to four ounces. If the fowls are drawn and cleaned as for a choice trade, the feathers, blood, intestines, etc., removed will weigh seven to twelve ounces according to method of preparation and size of fowl. In small broilers the shrinkage may be as little as one-fourth pound.

Shipping Alive—Among those who have only small lots of poultry to ship or who have had little practice in killing and dressing for market, the practice is increasing of shipping alive. Some commission men make a specialty of handling live poultry. Instructions and advice should be written for in advance. Live fowls are usually in demand in summer and during certain Jewish holidays. Great numbers of broilers are shipped alive in spring and summer. All live fowls

are shipped by express, usually in slatted coops with covered bottom. A reasonable amount of space should be allowed in the crate. Overcrowded fowls suffer and shrink in weight.

Coops for live shipments should be forty-eight inches long, thirty inches wide, twelve inches high for chickens and ducks, and fifteen inches high for turkeys and geese. Use lumber as follows: Use two by two for corner posts or one by two will answer. If you cannot get them, get one by four and rip them in two. Cut six pieces thirty inches long, and nine pieces twelve or fifteen inches long, for each coop; nail the short pieces one at each end; one in the center of the long ones (use

Fig. 29—FOWL DRESSED FOR FAMILY TRADE

tenpenny wrought nails). Make three of these frames, one for each end and the center. For the bottom use one-half-inch boards or lath, make the bottom tight (use sixpenny nails); use one-half by two-inch strips of lath for sides, ends and top; put them one and one-half inches apart; the width of lath is about right. Leave two laths loose on top in center, or make a door of them to open, in order to put poultry in and take it out; now nail a lath around the coops, each end and the center (outside the three frames made first). This will keep the lath from coming off and make the coops stronger. For broilers the coops can be made ten inches

high and twenty-four inches wide. This will make a good, strong, light coop.

Family Poultry—For choice private trade, prepare in an especially attractive manner, as in the illustration, Figure 29, in convenient shape for boiling or roasting. Pick the birds carefully, wipe off any discoloration with a moist cloth, singe carefully and remove any remaining pinfeathers, and the bird is ready for cooking. Customers appreciate getting poultry in just this shape. The feet can be left on, but

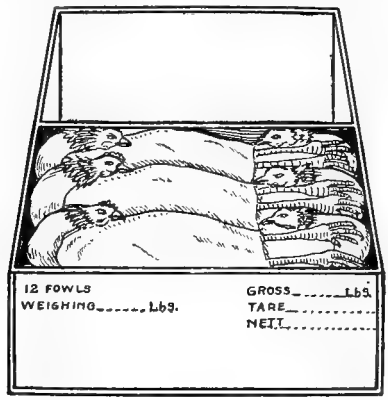

Fig. 30—CANADIAN SHIPPING BOX

when customers have confidence in the one furnishing them poultry, this is not necessary.

In exporting chickens for England, according to the advice of A. S. Baker, an English expert, select those weighing from five and one-half to six pounds each. They should have the head left on, a fringe of feathers left around the head, and the tail and wing feathers should be left on. They should be picked dry, never drawn, and starved for twenty-four hours before killing. They should be packed in boxes holding one dozen

chickens, with a partition in the center, six fowls on a side, packed heads and tails. The Dorking is the standard fowl of England. Canadian chickens weighing five and one-half to six pounds each bring eighty cents apiece, while those from the United States, which are much smaller and not specially fattened, bring but fifty-two to fifty-four cents. (See Figure 30.)

Killing and Dressing Squabs—The squabs should be killed before they get so large that they leave the nests. The standard size is eight pounds to the dozen. With properly kept birds this weight is usually attained in four weeks with straight Homers, and five weeks with Dragoons, says William E. Rice in Farmers' Bulletin No. 177 of the United States department of agriculture. The squabs should be caught in the morning before the feeding and watering is done. This assures empty crops. Judgment must be used in selecting the squabs, or some which are too light may be taken, causing a cut in the price. As caught, the squabs should be placed in pigeon hampers and taken to the killing room, which in cool weather should be heated to be made comfortable for the picker. Place the hampers within easy reach of the chair in which the picker is to sit, and have a basin of water close by. Directly in front of the picker, suspend in a horizontal position a ring of wood or iron, about a foot in diameter, and hang from the ring four cords eight inches long, terminating in slipnooses.

Killing the Squabs—Catch a squab from the hamper, and suspend it by passing one of the nooses around the legs, tail and wings, letting about two inches of the ends of the wings project beyond the noose, and tighten it well. Insert the killing knife (sold for such purposes) well into the back of the mouth and draw it forward, cutting clear into the brain. Hang a weighted wire in the bill and let the bird bleed. The wire is six

inches long, hooked and pointed at the upper end, and weighted at the lower end with a piece of lead the size of a hulled walnut. Four birds are killed in turn, and picking begins on No. 1 as soon as dead. Novices may kill and pick but one at a time until some speed is gained, but an expert picker will kill four and "rough pick" them all before they get too cold.

Dressing the Squabs—Allow the birds to remain suspended, but release the wings, grasping them both in the left hand back of the bird. Moisten the thumb and fingers of the right hand in the pan of water, and begin picking the neck, leaving about three-quarters of an inch next the head unpicked. Still hold the wings in the left hand until the entire front of the bird, legs included, is picked. Then, bringing the wings in front of the bird, hold in the left hand as before, and remove the balance of feathers from the body. Now, with wings still in left hand, pluck quills from both wings at once, and also the larger feathers, and then finish each wing separately. This completes the "rough picking," after which they must be pinfeathered, in which operation a small knife is helpful. An expert picker, when he has finished the third bird, kills three more so that they may be bleeding while he is at work with the fourth. As soon as finished each squab is dropped into a tub of cold water to drive out the animal heat and make the birds more firm and plump. An expert picker can kill and "rough pick" twenty squabs an hour or completely dress twelve to fifteen in the same time.

It pays well to use care in picking not to tear the skin or leave any feathers on the birds. Well-fattened birds are seldom torn by the expert picker. The weighted wire is of advantage in slightly stretching the skin and making it less liable to tear. When all the squabs are dressed, the feet and mouths must be thor-

oughly washed of all filth and blood; they should be placed again for a few minutes in clean cold water, and then hung on a drying rack for five minutes to drain.

Marketing—If the squabs are sold to a local dealer, they may be taken from the rack at once, placed in a suitable basket, and delivered immediately. If they are to be expressed to a distant market, packing in ice is necessary, and a box or barrel must be used. Place a layer of cracked ice at the bottom, alternate with layers of birds and ice, and finish with a generous topping of ice. Only in quite cold weather is it safe to omit ice. Place a secure covering on the package and mark full directions to whom shipped, as well as your own address, and the number of birds.

Squabs for Market—If squabs are killed before they can fly the flesh is white, but after that it darkens, reducing the value from one to two dollars per dozen. Those raising them for market should keep the old ones well supplied with food so that the young may become plump and fat. P. H. Jacobs advises: Always dry pick them, and remove all of the down. Leave on the heads, and leave the entrails in. Have them thoroughly cooled before packing, then ship by express. The rules for picking and shipping squabs apply to broilers. Leave all the feathers on the neck and the large ones on the wings and tail. Slips are dressed the same way. They are readily selected from capons by the growth of their combs and swelling of the spurs. These usually sell for several cents per pound less than the capons.

CHAPTER XII

MARKETING TURKEYS AND WATERFOWL

THANKSGIVING turkeys bring good money to those who can raise and put them on the market at that season. They must be fat, well matured and of good size to bring top prices, which means early hatching in spring and good attention in rearing. Turkeys are birds of a roving disposition and will not bear confinement well. They should be fed at least once, and; better, twice a day all through the summer and fall. The night feed may be old corn and the morning ration a mash composed of equal parts corn meal, ground oats and wheat middlings, mixed up with skimmilk. Farmers do not generally appreciate the value of milk for fattening poultry. For two weeks before killing time the turkeys can be confined if necessary, in a yard or pen, and fed all they will eat of the above feeds, but it will not do to shut them up longer than this, or they will lose instead of gain in flesh.

Put them in a shed not too light, but with an open front to admit air. Provide broad, low perches, ample feed troughs and dishes for water and milk. Corn meal, bran, cooked potatoes, oats and buckwheat are good fatteners; also a little cheap tallow or suet in the soft food. They cannot digest their food properly without plenty of gravel or grit. Feed only what food they will eat up clean. Before killing for market keep feed away from them for twenty-four to thirty-six hours, so that the crop and intestines will be well emptied. Hang up by the legs and kill by bleeding through the mouth. Plunge the knife through the roof of the mouth into the brain, when the bird will at once relax and not flutter. Have a barrel near by and strip off the feathers

at once. By being fairly quick one can pick a turkey clean before it has stopped bleeding and the feathers have had a chance to set. The tail and large wing feathers of the first joint are often left on, but if not they should be pulled carefully, one at a time, after the rest have been picked. Where the turkey is wanted for the family it may be scalded before picking, but for the market should be picked dry. Let hang to cool thoroughly before packing.

A Chicago commission dealer, who handles large quantities of poultry, advises the same methods as given on Page 125 for preparing chickens, but always dry pick turkeys. Dressed turkeys, when dry picked, always sell best and command better prices than scalded lots, as the appearance is brighter and more attractive. Endeavor to market all old and heavy gobblers before January 1, as after the holidays the demand is for small fat hen turkeys only, old toms being sold at a discount to canners.

A turkey producer and shipper of long experience, J. M. Cooper of Schenectady county, N. Y., thus summarizes the approved methods of finishing and preparing for market: "A good appearance with the turkey is essential for top prices. After the year's care of raising and feeding, do not allow from one-half to several cents per pound to be rubbed off because of hasty, careless or improper dressing or packing. This feature should receive as much attention as do the young poults in early spring. A well-picked, clean, untorn turkey, delivered in sound and attractive condition, will sell for much more than one bruised, torn and poorly cleaned. This finishing work takes but little time or money, yet it pays handsomely. I feed scalded corn meal twice a day and whole corn at night for three weeks before killing. I have never shipped turkeys to market, as there is a good demand for them in the city

near by. In dressing, I always scald; it is less work and they sell better in our markets. When turkeys are shipped to market, dry picking is best.

"If turkeys are mature enough to kill by Thanksgiving, I kill half of the flock two days before the holiday and save the rest until Christmas. If they did not begin to lay early, they will not be mature enough to fatten and dress well by that time; we are then obliged to wait until Christmas and New Year's. Small lots of medium turkeys will sell readily here at any time late in the fall, but large ones are not wanted except at holidays. Turkeys dressed in the very best shape to suit the market to which they are taken will sell for one-fourth more per pound than just as good ones carelessly dressed. Late, thin turkeys with pinfeathers and broken skin are a nuisance in a market and a loss to raiser, dealer and consumer. After I take prime dressed turkeys to a market I find it easy to sell there afterward at a little above market price. Most people are too careless to learn to dress turkeys nicely, or fail to see the importance of it.

"I confine them at least twelve hours without food before killing. A strong person should hold them by the wings near the body, another person cut the arteries on each side of the neck close to the head, with a knife. Hold the bird as long as it struggles; if not held they will bruise themselves. I kill two turkeys for every picker before I scald, and dress those before I kill any more. A turkey should be dressed in fifteen minutes. I have a six or eight-pail boiler on the stove, with four pails of boiling water and a barrel full of cold water ready, put nearly one pail of cold water into the four pails of boiling water on the stove, have a moderate fire; the one pail of cold water will reduce the four pails down to scalding heat, which is hot enough. Take the turkey by the legs, push it entirely under the hot

water with stub of an old broom, raise gently up and down to work the water under the feathers, and count ten. Then take it completely out of water to air it, count ten again, then plunge in water again and work up and down a little, at the same time counting thirty, then take out and plunge immediately into the barrel of cold water, and it is ready to pick.

"Pickers throw old bags or pieces of carpet on their laps or hang the turkeys up to pick. I am very careful not to allow them to be dragged around over anything, or else the skin will be broken and make dark spots when cold. If the large feathers on the tips of wings and tail stick, dip those parts in hot water again. If the bird are not scalded enough, count slower when dipping; if scalded too much, count faster. If they are not dipped in cold water immediately after being scalded, the heat in the feathers will cook the fat and tender parts so much that they will certainly be torn in picking. Even when dipped in cold water care must be taken, as the damage does not show much until they are cold. Dipping in cold water shrinks the skin so that they look plump and pick better. Scalding partly cooks the skin and gives them a rich golden color, while a dry-picked turkey skin is blue and wrinkled.

"When picked, open a small hole to take out the vent and intestines. Loosen the fat inside about the vent and roll it out so as to fill the hole nicely. Leave the crop in, as it is empty. Lay on a table or board on their backs, close together, so as to keep the wings close to the body, with head hanging down, and continue the killing. I take them to market one day before the holiday, cut the heads off and make the load up so as to show off to the best advantage, and sell to the fancy trade myself. If they are prime and fancy, I can set my own price and get it. My young turkeys bring from $2.50 to $3 each, two-year-old gobblers from $5

to $6. I would take my turkeys fifty miles to a large city and market them myself rather than to ship to commission merchants. From what I have seen in our markets, shipped poultry brings low prices in competition with choice dressed native stock. Wealthy people do not like shipped poultry and are willing to pay fancy prices." The illustration, Figure 31, a box of American poultry, shows how to box and ship turkeys.

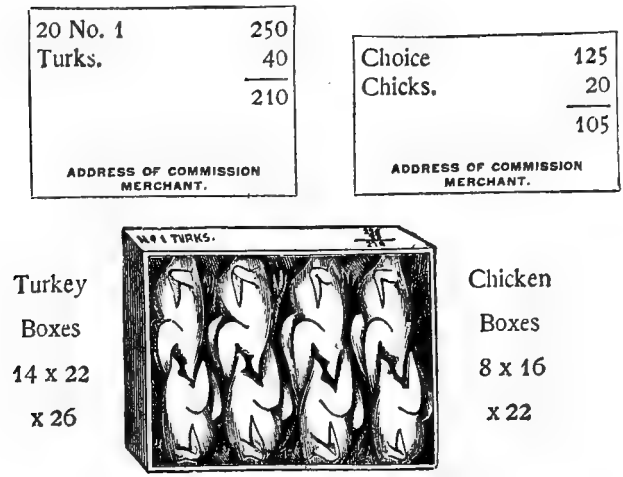

Fig. 31—TURKEYS PACKED AND MARKED

The movement and range of prices in former years are shown in the following table, compiled by the New York Produce Review, covering the receipts in packages for Thanksgiving week with quotations for best grade western turkeys; also the closing prices on the Wednesday preceding the national holiday in the years named.

TURKEYS THANKSGIVING WEEK AT NEW YORK

	Receipts, packages	Prices—Thanksgiving week	Prices—Closed Wednesday
1903	30,501	13 @22 c	17 @20½c
1902	24,913	15 @18	15½@17
1901	34,147	11 @13	11@12½
1900	40,963	8 @12	9 @10
1899	29,680	10½@11½	10 @11
1898	29,141	11½@12½	10 @11½
1897	—	10 @13	—
1896	30,603	11 @14½	12 @13
1895	29,363	9 @12	11½@12
1894	33,602	8 @10	8 @ 9
1893	28,233	9 @13	9 @10
1892	26,972	13 @16	13 @14
1891	24,358	13 @16	14 @15
1890	21,007	12 @16	15 @16
1889	27,295	10 @13	12 @13
1888	31,554	10 @14	10 @11

English Methods—The methods of English turkey fatteners, as described by E. R. Brown, include several good suggestions: About five weeks before killing, the turkeys are put up to fatten in a dry, comfortable shed, which must be large enough for the number of birds accommodated. Then the northern and eastern sides of this shed should be well closed in, but the southern and western sides may be wire netted, thus affording the inmates plenty of fresh air. Broad perches are provided, and must not be more than three feet above the ground. Food and water are placed in troughs conveniently situated, and away from the perches.

When shut up to fatten the turkeys are given all the food they will eat. The morning feed consists of barley meal and wheat meal. Some farmers who are very particular and have good customers mix the meals with milk, and give milk to drink instead of water, an inexpensive addition if skimmilk is used, and one which considerably improves the flesh. Although not much used, there can be no doubt that the addition of a little pure fat to the soft food is highly beneficial, softening the flesh. Cooked potatoes can also be added to soft food with advantage, and this applies to all fowls put

up for fattening. The afternoon feed consists of whole barley, oats and a little maize, which are more easily digested if steamed in hot water. When fully satisfied all food should be removed, the troughs emptied and washed after the morning meal of soft food.

In every case there must be a plentiful supply of coarse grit and sand available to the fowls, and a little slacked lime or old mortar will be an improvement. Without grit the turkeys cannot possibly digest their food properly, and without effective digestion flesh production will never be complete. Should any of the turkeys fight the culprit must be removed. Turkeys can be crammed by machines as are fowls.

Feeding Ducks for Market—The description is by a prominent duck raising expert, G. H. Pollard of Bristol county, Mass.: "At twenty-four or thirty-six hours old we take the ducklings out of the machines and put them into the pipe brooder that we have. A small brooder is perhaps just as desirable and as cheap, if you have not many birds. Then we start them on bran and meal, two-thirds bran and one-third meal, and if we have a supply of whole or skimmed milk we mix the mash with milk. We do not cook it at all. Sometimes we have taken two-thirds bran and one-third meal and scalded it and after it was cold we would mix in a few eggs, but not enough to make it sticky. Sometimes we have fed them as much as twenty per cent beef scrap. Drinking water should be kept by them always and particularly when they are feeding, as they cannot swallow the food without it, and it chokes them. If they do not have water by them all the time, when it is supplied they get into it and the ducklings tread upon and kill one another. At five or six days old we drop the milk and begin to add the beef scrap, about two per cent to begin with, and just a dash of salt. Then we begin to decrease the bran and add the

meal until we get even parts of bran and meal. At two weeks of age they will be getting half and half of bran and meal and five per cent of beef scrap.

"We often feed young ducks five weeks old as high as twenty-five per cent of beef scrap. I do not know that I would advise that always, but one must be guided by the condition of the market. One objection to feeding so much beef scrap is that it tends to make many pinfeathers. You can take a young duck at ten weeks old that has had no animal food and he will not show pinfeathers at all, while the same bird having had animal food would show a great many pinfeathers at ten weeks and at eleven weeks he would be too pinfeathery to dress. Ten weeks is the usual age at which they are dressed, but it depends largely upon what you feed them whether they are fit to be dressed at that age or not. The cost of caring for them and the cost of grains and meat foods decide the question whether it is best to dress them early or market them at a later date. I think that generally the quicker you can get rid of them the better it is.

"We kill at ten weeks. The common way of fattening would be to cut off the bran at eight weeks. We do not change the food from the time we begin to give them equal parts of bran and meal right up to the killing time, and so do not have the bother of getting the separate foods mixed. Green food we do not give at all to the young ducks, unless we intend them for breeders, and then we give them a moderate amount of green food. You can get quicker growth with beef scrap than to add green food. We usually kill at ten weeks, because at that time they pick better. Beef scraps start the pinfeathers; the bird that has had very little beef scraps will pick at twelve or thirteen weeks very nicely, but at ten or eleven weeks the pinfeathers start quite freely if the ducks have been fed with beef

scraps. The Pekin duck should be dry-picked. In the west and in New York state they are scalded quite extensively, but in the east they are dry-picked. In the south they pay only three cents apiece for picking, while we pay six to eight cents. The lowest prices in the duck market are from the first of July to the first of September, and from September to November the price always goes up from two to five cents a pound."

Killing and Dressing Ducks (Howard)—There are two methods of dressing ducks for market, by dry

Fig. 32—DUCK PICKING (Howard)

picking and scalding. Both of these methods are good and are being employed successfully by the largest raisers. Some have a preference for dry picking and others for scalding, and it is only a matter of taste which method is used. When birds are dressed by scalding they should be dipped several times, or until the feathers come out easily. The back should be dipped in the water first. After scalding, wipe them as dry as possible with a sponge and pick the breast feathers first. A bird when dressed for market has left

on it the feathers on the wings, tail, head and neck. The legs are left on and the birds are not drawn.

The process of dry picking is considered the simpler of the two methods, and one who is accustomed to the work can dress three dozen birds in a day. The picker's outfit consists of a chair, a box for the feathers and a couple of knives, one knife being dull, the other sharp-pointed and double-edged, for bleeding. The bird is taken between the knees, the bill held open with the left hand, and a cut made across the roof of the mouth just below the eyes. The bird is then stunned by striking its head against a post or some hard substance. The picker seats himself in the chair with the bird in his lap (see Figure 32), its head held firmly between one knee and the box. The feathers are carefully sorted while picking; the pins are thrown away and the body feathers with the down are thrown into the box. Care should be taken about this, as the feathers from each bird will weigh about two ounces, and will quite pay for the picking.

The dull knife and the thumb are used to remove the long pinfeathers, and this should be done without tearing the skin. The down can usually be rubbed off by slightly moistening the hand and holding the skin tight. Often some of the pins cannot be taken out without tearing and disfiguring the skin; when such is the case they should be shaved off. Seven or eight minutes is all the time necessary to dress a bird. After the birds are picked they should be carefully washed; and plumped by placing in a tank or barrel of ice water. They are hardened in this ice water and given a rounded and full appearance. They are then packed in barrels or boxes and shipped to market. The first or bottom layer is packed with backs down; a layer of ice is then placed over them, and all other layers are packed with the breasts down, a layer of ice being

between each layer of ducks. The top of the box or barrel is then rounded off with ice and covered with burlaps. A flour barrel will hold about three dozen birds. Some raisers use boxes for shipping and have the empties returned free. Figure 33 shows a pair of

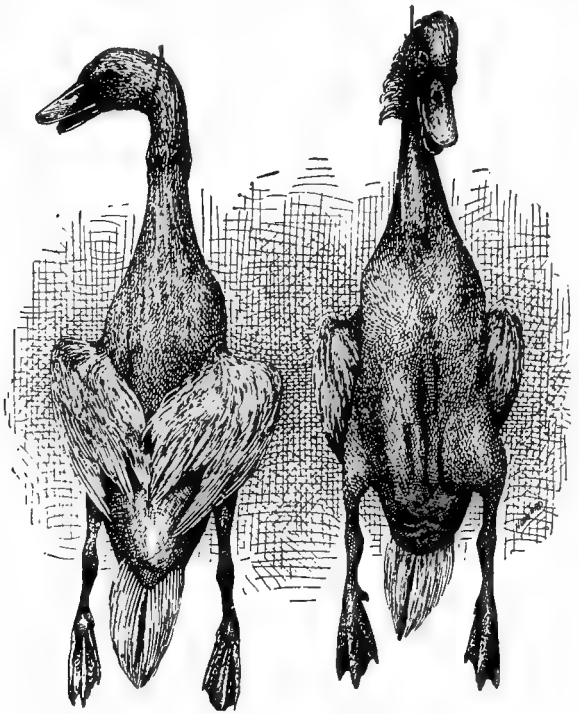

Fig. 33—PAIR DRESSED DUCKS TEN WEEKS OLD (Howard)

young ducks dressed for market, while the frontispiece shows a large eastern Massachusetts duck farm.

Dressing Ducks and Geese—A western dealer says ducks and geese should be scalded in the same tempera-

ture of water as for other kinds of poultry, but it requires more time for the water to penetrate and loosen the feathers. Some parties advise, after scalding, to wrap them in a blanket for the purpose of steaming, but they must not be left in this condition long enough to cook the flesh. Do not undertake to dry-pick geese and ducks just before killing for the purpose of saving the feathers, as it causes the skin to become very much inflamed, and is a great injury to the sale. Do not pick the feathers off the head; leave the feathers on for two or three inches on the neck. Do not singe the bodies for the purpose of removing any down or hair, as the heat from the flame will give them an oily and unsightly appearance. After they are picked clean they should be held in scalding water about ten seconds for the purpose of plumping, and should then be rinsed off in clean cold water. Fat heavy stock is always preferred.

Wholesale Goose Fattening—At Adamsville, R. I., there is a large goose-fattening establishment. The proprietors pick up the geese in carts when about half grown, that is, about the age that the quills begin to start; many farmers prefer to dispose of the geese in this way rather than have the trouble of fattening them themselves. The professional fatteners finish off the geese in four to six weeks. There is nothing secret about the method of fattening. They are given mostly corn meal, bran and meat, and fed all they will eat. At killing time, five or six pickers are employed, and these become very expert, dressing off from twenty to twenty-five a day. The product is shipped to New York and Boston; sometimes the demand is better in one city, and sometimes in the other. The poultry are dry-picked and feathers sold, being kept until winter and shipped all together. Goose feathers are usually worth about thirty-five cents per pound, duck feathers

from twenty-eight to thirty cents. Common hen feathers sell at four to five cents per pound.

Said Mr. Cornell, owner of this establishment: "This year I have fattened about 10,000 geese and about 4000 ducks, not as many as usual, as it has been a poor season. I feed them on corn meal and beef scraps, fattening them during September, October and November. I feed 100 bushels meal per day, and two tons of scraps per week. We do not coop them up in houses to fatten them; they are out in yards about thirty to forty feet square. I employ about eight pickers and three or four men to take care of the geese. Most of my poultry goes to New York market. We stick them in the roof of the mouth to bleed them, and hit them on the head with a small stick. Do not pick the neck or wings, only the body. I pay ten cents for picking geese and six cents for ducks."

According to another specialist, geese may be finished for market by feeding liberally about four weeks in coops. An old shed is a good enough fattening place. Good foods are corn meal and shorts, boiled oats, brewers' grain and some fresh green stuff or boiled potatoes. Gravel or grit is positively needed, also plenty of water.

Special Fattening of Geese—The most extreme method of artificial fattening is employed with geese whose livers are to be used for the delicacy known as "foie gras" (fat liver). In Farmers' Bulletin No. 182 of the United States department of agriculture, Helen W. Atwater says this art of fattening geese until fatty infiltration of the liver has set in and that organ weighs from two and one-half to three pounds, is practiced on a large scale about Strasburg, Germany, and to a less extent about Toulouse and elsewhere. The birds are usually confined in small, dark cages, where they can move only a few inches, and are fed two or three times

a day, commonly with all the ground maize or wheat flour paste they can be made to eat. When they have become very fat, usually at the end of about three weeks, they are killed and the livers removed.

The livers, which are perhaps no more abnormal than the flesh of an overfat hog, commonly appear in

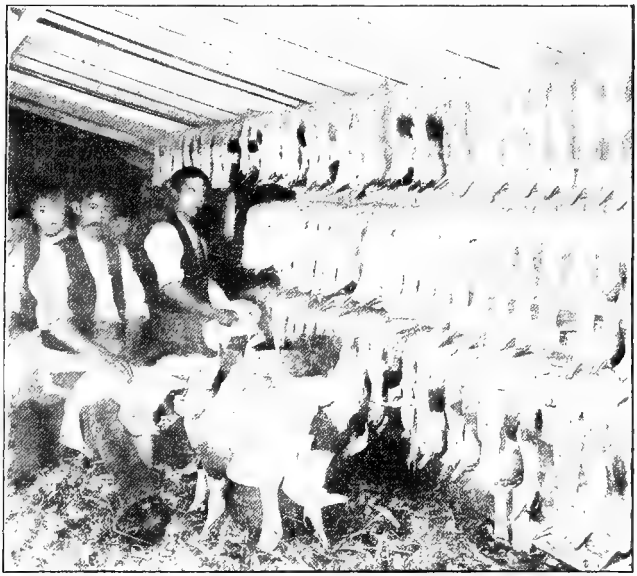

Fig. 34—KILLING DEPARTMENT OF AN ENGLISH DUCK FARM

our markets in jars or tins in three distinct forms: *Foie gras au naturel, pate de foie gras* (by far the most popular), and *puree de foie gras.* The *foie gras au naturel* is simply the liver preserved without any dressing. The *pates* are made of large pieces of the liver, cooked and dressed with truffles and other con-

diments. These pieces are fitted into cans by trimming off the edges, and are covered with melted goose fat or suet. Many persons find the flavor of the goose fat too strong and prefer the suet. The trimmings of the liver in the *pates* are preserved with truffles, etc., and sold as *puree de foie gras.*

English duck raisers mostly prefer the Aylesbury variety. At eight or nine weeks the Aylesbury weighs about six pounds. Such foods as ground oats, barley and rice, also bran, take the place of the corn meal and bran so largely fed in America. Meat scrap and tallow are used freely. Ducks are killed by cutting the large veins of the head. Some killers let the carcass become cold before picking in order to prevent tearing, but this practice makes the process of picking more slow and difficult. The feathers around the neck and head are left on, as shown in Figure 34, a duck killing room, from a photograph kindly loaned by Mr. Peter Walch, who markets about 20,000 ducks per year from his farm in Lancashire, England, a part of which is shown in Figure 35.

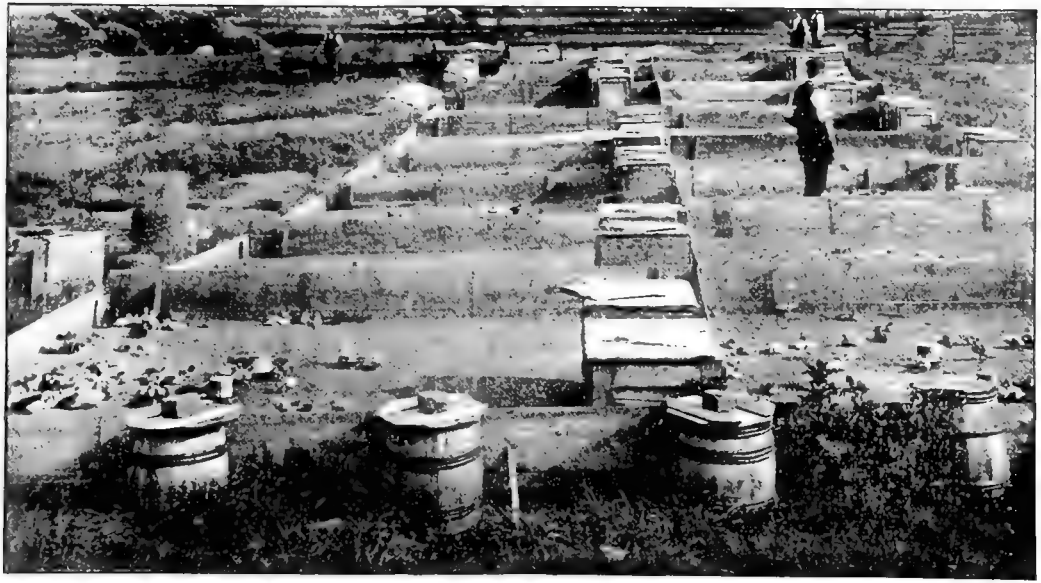

Fig. 35—THE INFANT DEPARTMENT OF AN ENGLISH DUCK RANCH

CHAPTER XIII

FINISH AND SHAPING

THE farms of the land need to produce not only more poultry, but better poultry. Think for a moment where the bulk of the meat on a fowl is placed. It is on the breast and the thighs. There is practically no meat elsewhere. Then how foolish to go on breeding year after year from birds that are flat in breast and scant in thighs.

The illustration, Figure 36, "Breast and Thigh Development," shows a side view of the average fowl

Fig. 36—BREAST AND THIGH DEVELOPMENT

in the market. The breast flesh ought to go out to the dotted line, then there would be twice as much of the white meat, and it would cost no more to bring the bird to maturity. The middle figure of the same illustration shows a cross section of the average market fowl, the dotted sections showing the breast meat. Breed a round, wide-breasted bird and the breast meat would come out to the dotted lines and double the amount produced. Look carefully to the shape of the breeding stock and select birds that are built to carry a large amount of breast and thigh meat.

The best market fowls carry the white meat not only on the breast proper as at *b* in the third figure of the illustration, but also well back between the legs at *a*. Much of the market poultry fails to be thick-

meated at this point, *a*, and this is a vital defect. The pure bred Wyandottes, Plymouth Rocks and Rhode Island Reds are especially noted for carrying a generous quantity of white meat not only upon the breast, but also well back between the legs, and this is one of the reasons for the market popularity of these two breeds.

There is no reason to suppose that any of the breeds used for market poultry in Europe are at all superior to the standard American general purpose breeds. In fact, some of the foreign breeds have dark legs, blue meat and other peculiarities that would make them unpopular in American markets. The excellence

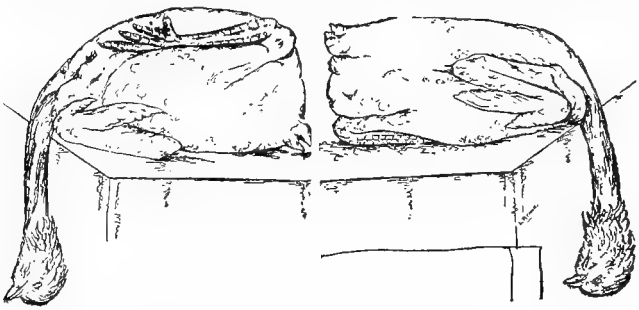

Fig. 37—SHAPED SUSSEX FOWLS
(Breast upward and breast downward)

of the best grades of foreign poultry is due to care and artistic finish during the whole process from feeding pen to market. With the same care and the use of the various special processes, American grown poultry is found able to compete in foreign markets, securing nearly or quite as high prices.

The appearance of some English dressed poultry (turkeys, ducks, etc.) at the cattle club show, Smithfield, England, is well brought out in Fugure 37. The chief

peculiarities of the English method are: Killing by wringing the neck, not by chopping or sticking; feathers are left on the neck for a few inches from the head, also a few feathers on tail and tips of wings; the breast bone is sometimes broken down by pressing it to one side with the thumbs, and the wings are twisted to the back of the bird.

The French exhibit is especially well staged, showing its merits to best advantage. The specimens are of large size, very clean and white and well finished

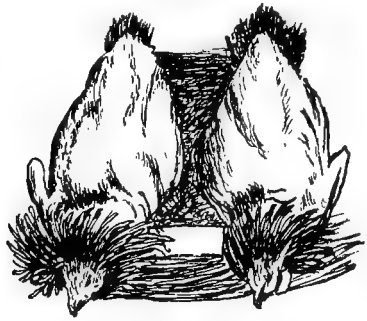

Fig. 38—SHAPED FOWLS (French)

by shaping as described elsewhere. They are shown back uppermost, while English and American exhibitors place them breast up. The methods by which the finest grades of foreign poultry are fattened and finished for market are fully explained in this work.

Shaping (E. R. Brown)—Although French systems of shaping are practically unknown in this country, it is desirable to refer to them, as for the finer qualities of fowls they might be adopted in many cases with advantage. The first is that most common in France. In this case a board, from fifteen to eighteen inches long and five to eight inches wide, in accord-

ance with the size of the fowl, is used. In this board, Figure 40, which is usually one inch thick, are driven eight pegs at equal distances. When the bird is killed it is quickly plucked, and the head, legs and inner bowel most carefully washed. It is then laid breast downward on the board, and the back pressed in with the hand, causing the ribs to crack slightly and loosening the breast muscles. When this is done the fowl does

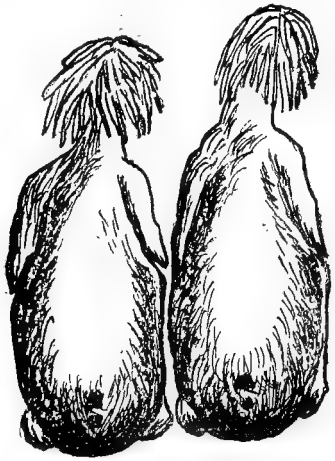

Fig. 39—SHAPED POULTRY (La Bresse)

not again return to its normal shape, and the meat being forced to the breast of the fowl, gives that flat appearance which is so desirable. The hocks have already been tied with the wings through them. When placed in position upon the board the rump and crop are supported by pads of stout paper, or small blocks of wood, covered with cloth, in order to keep the fowl level. A strong linen cloth which is first dipped in milk and is the length of the bird's body, is very tightly drawn over the back, and the eight tapes,

Figure 41, provided for the purpose, are tightly attached to the pegs of wood, the head and neck hanging down at one end. The whole is then drenched with cold water, and left to set. Such a system, although apparently giving great trouble, is very simple, and brings out all the best qualities of a fowl. These shaping boards can be made very cheaply, at the cost of a few cents each, and the lady members of any household can make the linen cloths.

Another system, which is found almost exclusively in the La Bresse district of France, is peculiar to that country, and to it is due the unique shape of La Bresse

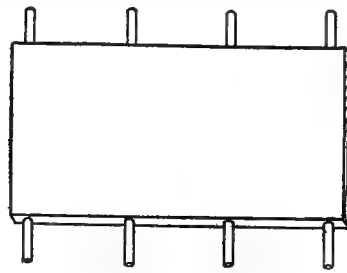

Fig. 40—FRENCH SHAPING BOARD

fowls. Small poultry keepers and great fatteners alike adopt this method. Every fowl, no matter how small its price, is prepared in the following way: For this purpose two cloths are used, the first a piece of fine linen, and the second an oblong piece of coarse linen or canvas. The shape of the former does not matter so much but the latter requires to be of a certain make. So soon as the fowl is killed it is plucked, and whilst warm, wrapped, first in the fine linen, and then in the coarser material; the latter is drawn very tightly, either by tapes or cords passed through holes provided for the purpose, or is sewed up with fine strings. These cloths

envelop it completely. It is stitched first from the stern up to the hocks, and then along the body to the neck, the legs being laid on either side of the breast and encased with the cloth. The fowls are dipped in cold water and allowed to remain in this position from twenty-four to thirty-six hours. When taken out they have a sugar-loaf shape, the head being at the apex and the stern at the base. The effect of this system is to smooth the skin and give it a very pleasing appearance. The shape of this cloth is shown in Figure 41, at the right.

Whatever the system adopted of shaping, it is a most important point that the bird shall be plucked carefully, and it is customary in some parts to employ the services of what are called "stubbers." If any of the feathers, especially the short quills, are left in the flesh, they will depreciate the appearance of the fowl. Fowls are singed immediately after being plucked, and stubbed.

The Sussex System—Shaping is carried out in Sussex, England, as part of the process, but in a very different manner than that just described. There can be no question but that the appearance of the fowls is improved thereby. This system is so simple that it can be adopted at very small expense, the shaping boards being easily made. An illustration of Canadian shaped poultry, Figures 42 and 43, shows a shaping board built in three rows, and capable of holding thirty to thirty-six birds at one time. For smaller producers it can be built with one row, and the cost of material for construction of the large size would not be over one dollar. Each trough is made V-shaped, the front of which is rather narrower than the back. These troughs consist of only twelve pieces of wood, namely: (1) The two upright ends, thirty-six inches by seven inches; (2) three troughs, each made of two pieces at right angles, the

back board six inches wide and the front five inches, and thirty inches long; (3) the bottom stay; (4) three loose boards, half an inch shorter than the troughs and four inches wide. It is better to use smooth boards five-eighths or three-quarters inch thick, and fit the whole firmly together.

The operation is as follows: As soon as the birds are plucked, which should be done carefully and thoroughly, the hocks are tied loosely together, so the legs

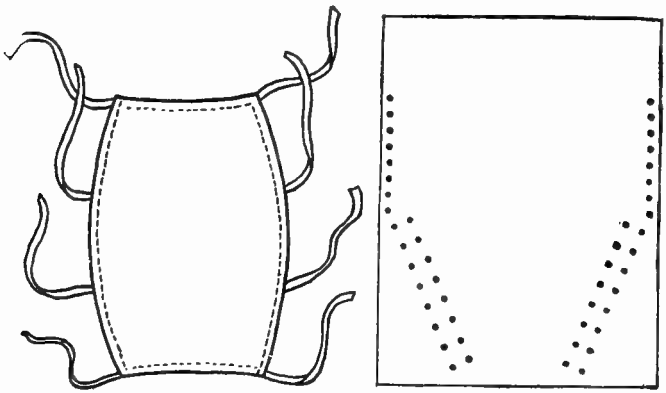

Fig. 43—FRENCH SHAPING CLOTHS

are flat against either side of the breast. Before doing so some of the most skillful fatteners draw the meat upward by means of the hands, and this undoubtedly improves the appearance of the bird, though it must be done carefully to prevent breaking of the skin. The operator strikes the stern against a wall, thus flattening and making it fit the shaping trough more easily. Each bird is laid in the trough breast down, with the neck and head hanging over the front. The first bird is pressed firmly against the end of the trough, and a glazed brick or weight laid by the side to keep it in

position. When the second and succeeding birds are placed in the trough the weight is moved along until quite full. It is necessary that they should be packed firmly and tightly in this way. Next a loose board, four inches wide, and half an inch shorter than the trough, is laid upon the back of the fowls, just behind the wings. Upon this are placed three or four heavy glazed bricks, or two weights of fifty-six pounds, and the fowls are allowed to remain in the trough for several

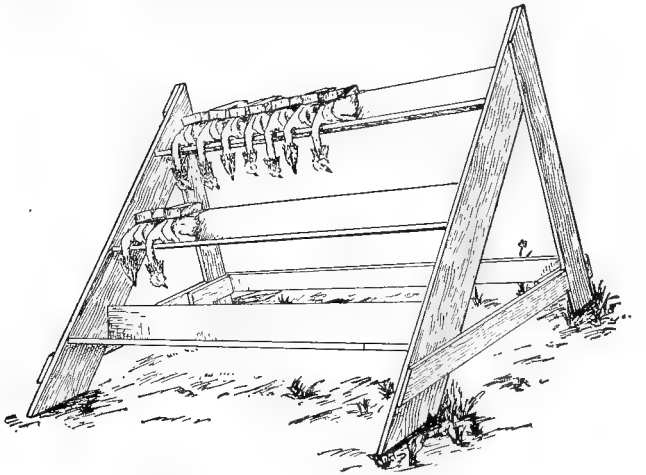

Fig. 42—CHICKENS IN CANADIAN SHAPING BOARDS

hours, in fact, until they are quite cold and set. When taken out they have the appearance shown in Figure 43. In all such matters it is desirable to study appearance and what are the market requirements. For London trade it is necessary to send birds so shaped in order to secure the best prices. Of course shaping does not add one iota to the weight, nor anything to the edible value. But it is none the less important, for the eye is the inlet to the pocket as to "the soul."

American Methods—At the Canadian poultry stations the method of shaping is practically the same as the English or Sussex method. When the chickens are plucked they are put on a shaping board. That may be a board about six inches wide, placed against a wall and making with the wall an angle of about ninety degrees. Or it may be a V-shaped trough with that angle. As soon as each chicken is plucked, its legs are placed alongside its breast. The stern of the chicken

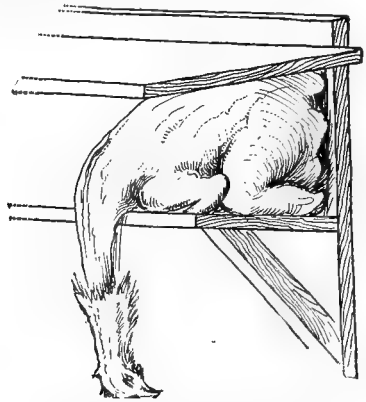

Fig. 43—CHICKEN IN CANADIAN SHAPING BOARD

is pressed into the angle of the shaping board or trough. Each bird is laid in with its breast downward, a glazed brick or other weight is laid on top, another brick is put alongside to keep it in position until the next bird is pressed closely there. After the row is full the chickens are left lying on their breasts with sufficient weight to hold them firmly and crush the breast bones slightly, but not so as to break them. While they are in this position the body is partly drained of the blood which collects in the neck. They are left there to cool and set, and then are packed in crates for shipment.

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