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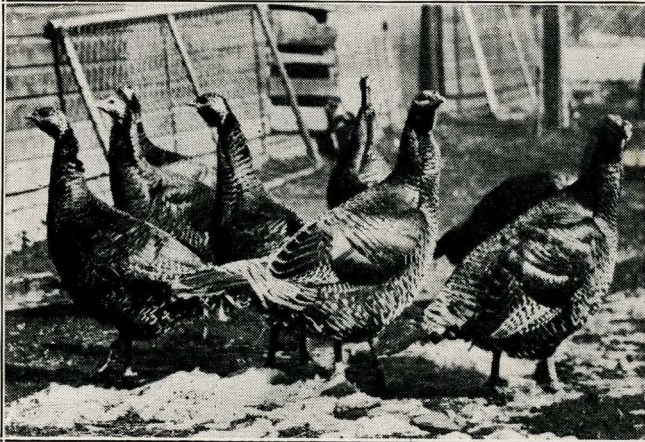
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Turkey Production in South Dakota



**SOUTH DAKOTA STATE COLLEGE
EXTENSION SERVICE**

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Turkey Production In South Dakota

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The turkey is truly an American bird and suggests not only Thanksgiving to Americans but America itself to the world. The Cyclopedia of Agriculture comments that America has furnished but few domestic animals and mentions the llama of South America, the turkey, and the bison as a third possible example.

In the earliest days of white men in this country, the wild turkey was found from New England westward to South Dakota and southward to Florida and Texas, also in parts of New Mexico, Arizona and Mexico. The turkeys in the southern states were considered to represent three or four slightly different varieties. In central America, a second species of wild turkey was found, known as the Ocellated turkey. This bird was described as having a more handsome plumage, some feathers bearing markings like those of the peacock.

Turkeys were taken from Mexico to Europe by the Spaniards about the year 1500, and were introduced into England in 1550. Strange as it may seem, the ancestors of our turkeys of today were brought from Europe. It was, therefore, the Mexican wild turkey from which our present fowls originated, and not from the eastern turkey that the Pilgrims found.

Turkeys were forest birds, living upon nuts, berries, seeds, insects, and large amounts of green feed. They were not migratory, or only to a slight extent; they were much like our prairie chickens. The history of most of our cultivated plants and domestic animals is lost in antiquity. The turkey is a comparatively recent addition to the list and may be said to be only half domesticated as shown by his preference for roosting in trees or out in the open at night and by the habits of the hens in hiding their nests. Although it is only four centuries since the turkey has been known to white men, the origin of the different breeds is but incompletely known. It is generally believed that some of our varieties resulted from crosses between the wild and the introduced birds, but this is not definitely known.

As a native bird, the turkey soon disappeared with the settling of the country and now is found only in a few remote places. It is fortunate, indeed, that the wild turkey has been sufficiently domesticated to be found on a great many farms of this country where it may remain indefinitely, the one great contribution of North America to the domestic animals of the world.

Since the year 1890, turkey production in the United States as a whole has been on a steady decline. At the time of the census of 1900 there were produced on farms of the United States 6,594,695 turkeys; in 1910 the number had decreased to 3,688,708; and in 1920 a further decrease to 3,627,028.

This decrease is due to several factors, the most important of which is a contagious disease known as black head. The organism causing this disease lives in the soil and when the grounds become infested, large losses in both young poults and adult turkeys occur. This condition has discouraged many turkey raisers, especially in the older settled farming areas of the eastern part of the United States. This condition has caused a

TURKEY PRODUCTION IN THE U. S.

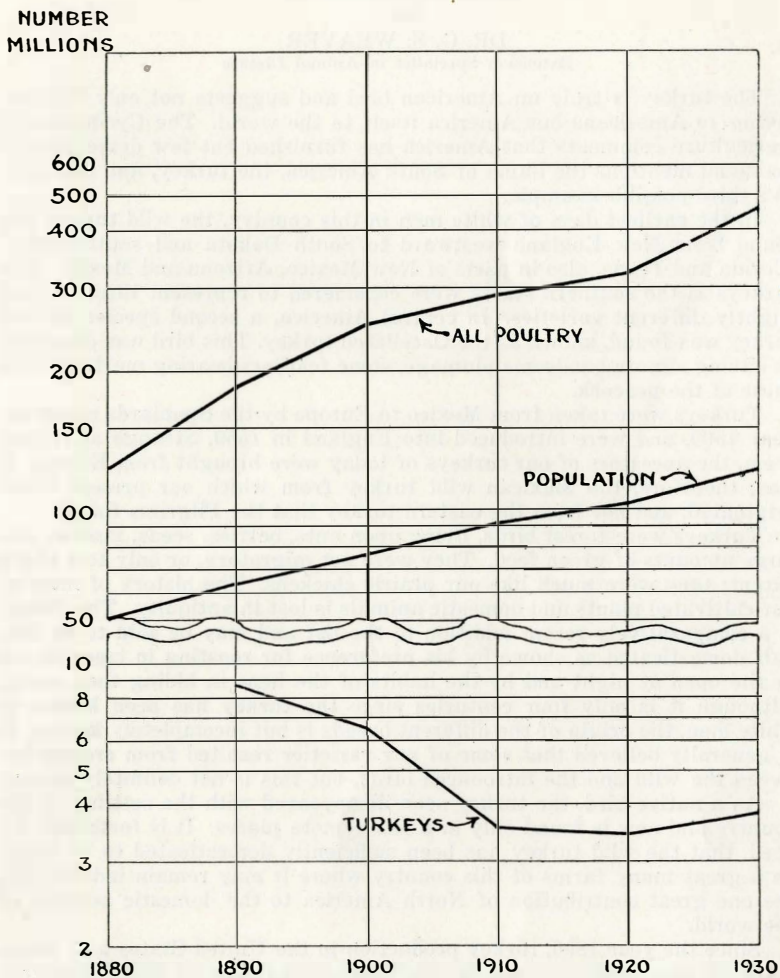


Fig. 1. Turkey production in the United States declined consistently from the year 1890 until 1920, as shown by the above graph. Since 1920 a slight increase in production has occurred.

shifting of the center of turkey production towards the more sparsely settled areas of the west and northwest, where there is greater ranging space and consequently less danger of contamination. Details of this disease and methods of control will be taken up in another portion of this circular.

Selection of Breed

There are six recognized standard breeds of domestic turkeys, as follows: the "Bronze" commonly called "Mammoth Bronze"; the "White Holland"; "Bourbon Red"; "Narragansett"; the "Black"; and the "Slate."

The Bronze is the most popular, due largely to its greater size and weight. It is also the oldest breed. The other breeds follow in the order named—White Holland, Bourbon Red and Narragansett. The Black and Slate breeds have not gained much popularity in the United States. The reason for this is due in most part to their relatively small size as compared with the other breeds mentioned. The Slate variety does not breed very true to color which is an added disadvantage.

A great deal of preference is given to the White Holland, Bourbon Reds and Narragansetts, due to a popular belief that these breeds are more domesticated and do not roam so far afield, thus preventing losses due to birds and animals of prey and also causing less trouble with neighbors on adjoining farms. This may be true in part, but where turkeys are brooded by artificial methods, they are all very tame and easily handled regardless of breed.

Choosing a breed of turkeys is like choosing a breed of chickens, and should be governed largely by the individual taste. If one does not think that he has the best breed or variety, he will not have the best as they will not receive the best that he can give them in the way of feed and care, because they will not appeal to him. A desire to have a different variety than is kept by the nearest neighbor in order to avoid a dispute over ownership is sometimes a factor in deciding the breed to raise. This will not prove an important factor if the instructions in this circular are followed, i. e., that it is more profitable to keep turkeys enclosed in fenced areas at all times.

Selecting Breeding Stock

The most satisfactory time of year to select breeding stock is in November or December before large numbers have been sold for the Thanksgiving and Christmas markets. Selecting birds early gives one a choice from a larger number, and more important still, the best developed birds can be saved for breeding instead of being marketed. Do not make the mistake of marketing the best of the flock and keeping the weak, small and under-developed birds as breeders. This is done in too many cases and results in loss of vigor and general running down of the stock.

Turkeys are raised for meat production. The breeders should possess bodies well adapted for meat production. The ideal breeder is a rangy bird, with a good large frame. The back should be broad, especially at the shoulders, and the breadth should be carried well back towards the tail. The body should be deep, with a full well-rounded breast. The breast bone or keel should be long and straight, carrying the fleshing well to the rear. The legs should be strong in bone and set well apart. Above all else be sure to select vigorous birds. This is of fundamental importance and should never be overlooked.

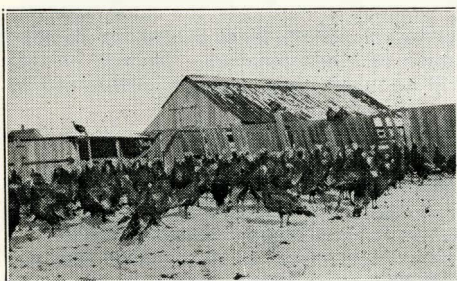


Fig. 2. Turkeys grown successfully by semi-confinement method on the Rainbow Turkey Ranch owned by George E. Lamm, Philip, S. D.

Select or build up a flock of purebred turkeys, for they are more profitable than mongrels or crossbreds. It costs no more to raise purebreds and they are usually heavier and command a higher market price. There is the added advantage of sale of purebred birds for breeders at increased prices, also eggs for hatching.

New blood may be introduced into the flock or a start may be made by purchasing

hatching eggs, baby poults or adult breeding stock. There is less danger from diseases or parasites in the purchase of hatching eggs or poults than in buying the mature stock. However, there is an advantage in the saving of time by starting with adult breeding stock, if one is fortunate enough to have a source of disease-free stock. Starting with breeding stock, one should, with a fair degree of success, produce some surplus turkeys for market the first year; whereas starting with a small number of eggs or poults, probably only breeders for another year would be produced. Circumstances in the nature of finance, brooding equipment, and previous experiences should decide the manner of starting. There is just one piece of advice to be given in this connection and that is to begin slowly, and to grow into the business.

The difficulty of obtaining good hatching eggs at a reasonable price and early enough in the season is also a factor which may be a further argument for starting with an adult breeding flock.

It is convenient and in many cases necessary to purchase mature males, as the feather markings can be observed and a bird of desired color pattern secured. Adult birds purchased should be kept separate from the flock for a few weeks to make sure that no disease is present. If the bird has not been treated for intestinal worms, it would be well to do it at this time. The history of the flock in regard to disease should be investigated before purchase is made.

Breeders of Bronze turkeys sometimes resort to the introduction of wild blood (wild turkeys) into the flock with the idea of increasing immunity from disease or of improving the disease-resisting powers. This is an erroneous idea as the wild turkey will succumb to turkey disease when exposed. This practice will also result in materially decreasing the size of the birds, increasing the tendency to roam, and also in a loss of color markings. Crossing of breeds is generally conceded to produce birds of greater vitality, but what may be gained in this way is off-set by the loss in purity of breed and color markings and there is the difficulty also in not knowing what to do next and hence the danger of having the strain simply degenerated to ordinary mongrels. The practice of sanitary methods and the rotating of grounds used for rearing turkeys will do more in preventing disease than cross-breeding.

Breeding Males

Birds used as breeders should have size and constitutional vigor. Early hatched, well developed, vigorous males can be used in their first year with good results providing they are mated with not more than twelve females. The value of a male as a breeder depends entirely on the individual bird. The number of females to mate with a male depends on the age and condition of the male.

A Tom is considered at his prime in his second year or when classed as a yearling. As a yearling, he will be more mature, better filled out and have more constitutional vigor. A yearling can be mated with 15 females with good fertility results. A Tom will continue to give good results as a breeder as long as he maintains good constitutional vigor. In many cases, however, the breeding ability of a Tom declines somewhat after he has passed his second year.

Use only standard bred, well-marked Toms to head the flock. A good Tom is essential if the quality of the flock is to be maintained or improved. The improved market value of the progeny will usually pay for a good Tom in one season.

Breeding Females

Young hens or pullets will make good breeders, if they are well developed and vigorous. As a rule, they lay more eggs as pullets than as yearling hens. It is advisable to select the breeding hens from the standpoint of number of eggs laid, fertility and hatchability, vigor, and color markings of progeny, etc., where this can be done. Good breeders selected in this way can be kept for several years and thus increase the percentage of poults per hen. In the Bronze breed select pullets with good quality reddish copper bronze. Those having a greenish cast will carry very little bronze as yearlings.

Care and Management of Turkey Breeding Stock

After the surplus Toms and market stock have been disposed of in the fall, the breeding stock to be retained should be moved to winter quarters where they can be cared for with the minimum of labor and expense. At the same time, it is important that the breeders are not neglected as success with the following year's crop of poults is dependent on the health and vigor of the breeding flock. It is reasonable to expect that the flock will be infested with some intestinal worms. It is a safe policy to treat the birds of the breeding flock with a good worm tablet or capsule which will remove both tape and round worms. The breeders should be examined for lice and if any are found they should be treated with sodium fluoride or blue ointment.

A quarantine should be maintained at all times. Any birds showing signs of illness, birds purchased as additional breeders, and those returned from poultry shows should be confined in the quarantine for a period of about thirty days. This quarantine or place where diseased or suspicious birds are maintained need be only a reasonably small area which can be disinfected with ease. If this practice is not followed the turkey raiser has no method of breaking up the connecting link between a diseased bird and the remainder of the flock.

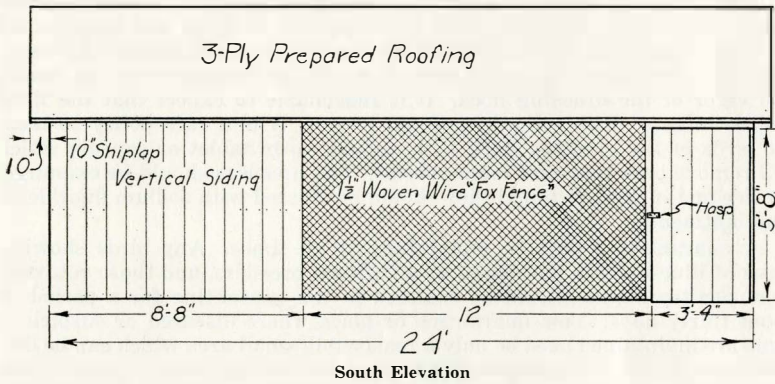
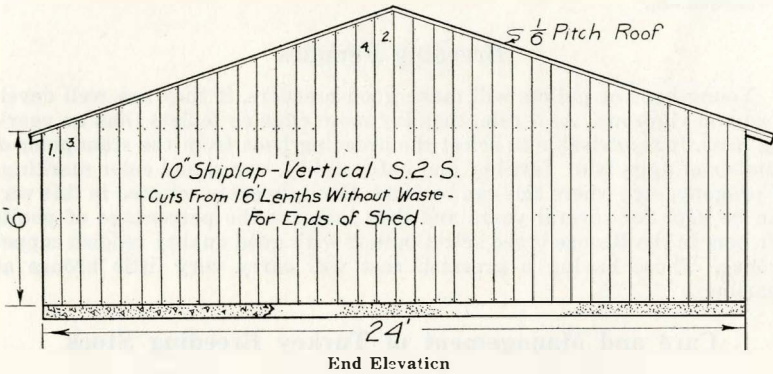
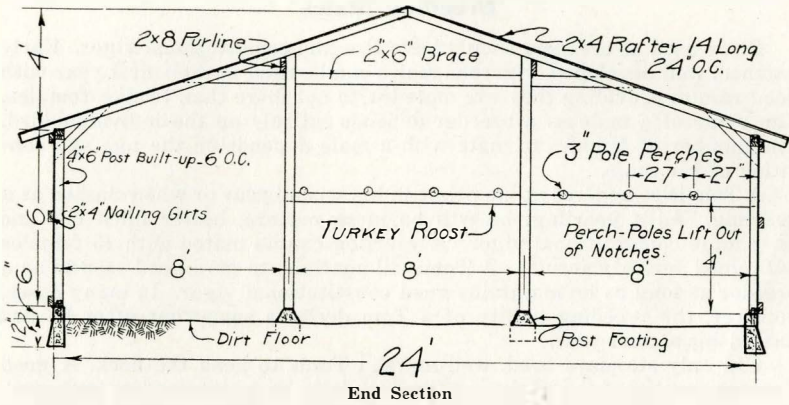


Fig. 3. The South Dakota Turkey House
 Drawn by Agricultural Engineering Department, South Dakota State College.

Winter Shelter

Some form of winter shelter should be provided. It is true that the natural habit of the turkey is to roost outside during the greater part of the year. However, turkeys have the instinct of detecting an approaching storm and at such times will seek shelter. The shelter for the breeding flock of turkeys need not be expensive or extremely warm. A shed of machine-shed type, closed on three sides and practically open on the south will serve the purpose very well. It may be advisable to board up the west one-half of the south side or exposure, leaving the east half open. This opening should be provided with poultry netting for use at times when the turkeys are to be caught and handled for any purpose. A 4-foot door covered with poultry netting is sufficient opening.

This building should be situated at a sufficient distance from the chicken runs to avoid danger of contamination. A plan is shown herein of a suitable building for this use. This building can be constructed of barn boards or shiplap using them in upright position, and should be built about 24 feet square. A building of this type is economical and could be used conveniently as a shelter for sheep or for housing farm machinery in case the turkey venture should prove unsatisfactory. Roosts should be provided, both inside and out. Poles of about three inches in diameter make excellent turkey roosts. They can be placed at a height of about four feet from the ground at the south side of the building with an equal amount on the inside. When a storm is approaching the birds can seek shelter on the inside. A 5-foot fence should enclose the grounds to prevent the turkeys from coming in contact with chickens or possible contamination.

Feeding the Breeders

Winter care of the breeders is also important from the standpoint of early spring production of hatchable eggs. The breeding birds should be kept in good condition, yet they should not be too fat. By feeding a balanced ration the birds can be kept in good condition. A grain ration consisting of equal parts of corn, wheat, and oats; or one composed of two parts corn, two parts wheat, one of oats, and one of barley or speltz will serve very well. In addition to the grain, a good mash should be fed in a self-feeding hopper. During the winter months the following mash is recommended:

- 100 lbs. yellow corn meal
- 100 lbs. of bran
- 100 lbs. of middlings
- 100 lbs. ground oats
- About 5% of meat scrap
- 5 lbs. of salt
- 12 to 15 lbs. of bone meal

In addition, grit, charcoal, and a good quality of oyster shell should be available at all times. It is advisable to feed both the grain and mash in hoppers as this method is more sanitary.

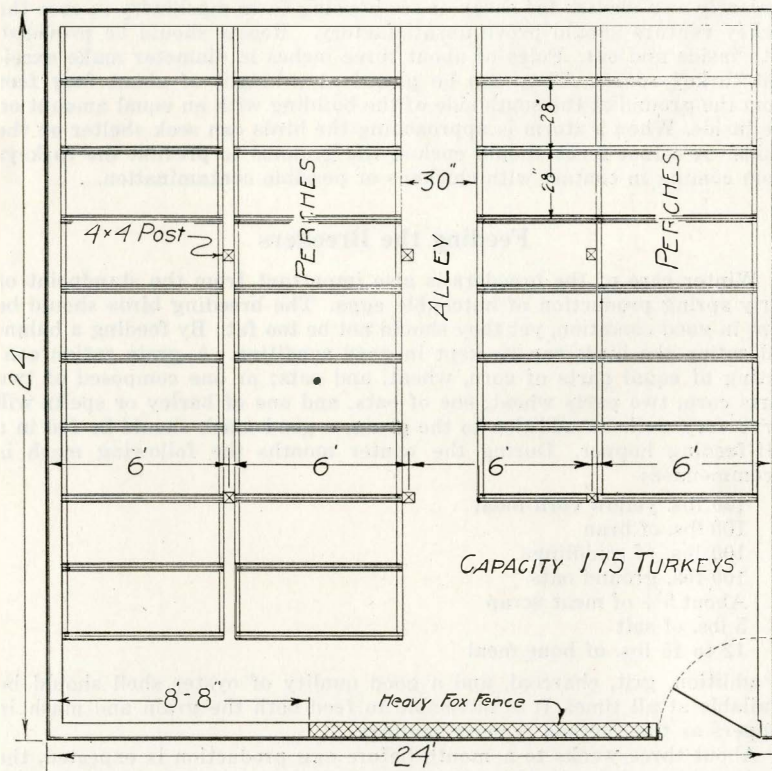
About three weeks to a month before egg production is expected, the mash portion of the feed should be changed, the proportion of meat scrap being gradually increased to 20 percent, which would be 100 pounds of meat scrap with 400 pounds of the other ingredients. This increases the

protein content and encourages higher egg production. The hens will begin to lay a week to ten days after the first warm days in spring. Turkey hens lay their eggs in clutches of two or three dozen eggs to the clutch. An average of over two dozen is considered good. After each clutch of eggs has been laid the birds become broody for a short period. If not encouraged to sit they usually mate again and begin laying a second clutch.

Plans of Breeding Pens

When large breeding flocks are kept requiring two or more Toms some plan should be worked out to keep the Toms separated. If this is not done there will be lowered fertility due to fighting of the males. There are three possible plans.

One plan is to provide separate breeding pens for each Tom and his allotted number of females. Where this plan is followed it is necessary to arrange the pens so that the Toms do not see each other. The natural wild habit of the turkey demands a fight to the finish for supremacy of the fem-



Floor Plan

Fig. 4. The South Dakota Turkey House

ales during the breeding season. If the Toms are separated only by a wire fence they will spend much of their time walking back and forth along the fence, and fighting through it, tearing their feathers and causing more or less injury to both. Due to the state of agitation, and excitement produced in the Toms and the time spent in this manner, the mating is neglected and the fertility will be reduced. To avoid this condition, breeding pens should not be adjoining, or in case they are the fence should be of boards or of wire covered with burlap or in some manner obstructing the view from one pen to the other.

Another method is to have only one breeding pen and allow only one Tom out with the hens at a time.

A third plan is practiced by some very successful breeders but it involves a greater amount of labor. It may be termed "stud mating". The Tom is kept in a separate enclosure with a small shelter provided. The hens are brought to the stud pen two or three times during the season as the attendant observes their actions.

By this latter method the number of hens that can be mated to one Tom is greatly increased. By having the hens leg-banded and numbered, pedigree breeding can be followed with this method.

Mating for Color

In selection of breeders for improving color pattern common sense rules should be followed. In the bronze for instance, if the hens are poor in white edging or lacking in quantity or quality of bronze a male should be selected that is strong in those sections to overcome this weakness in the offspring. Do not mate a male and female both having the same defective qualities as this will result in intensifying the defect in the offspring; for instance, hens having gray at the base of the tail in the bronze variety should not be mated to a Tom having the same defect. To do so may intensify this defect to the extent of a disqualification in a large percent of the offspring.

Fertility

One mating will fertilize the entire clutch of eggs, but if a female becomes broody and afterwards starts laying, she must be mated again to produce fertile eggs. The male should be with the hens a week to ten days prior to setting eggs to insure fertility.

Care And Selection of Eggs

By keeping the breeding flock in a fenced enclosure the labor of gathering the eggs is greatly reduced. Due to the natural wild instinct of the turkey, the hens like to steal their nests and lay in secluded spots, and when not enclosed by a fence they often select a nest a great distance from the roosting place. In such cases large losses are caused by predatory animals and birds and chilling in early spring.

Barrels or boxes placed about the yard covered with straw or brush make suitable turkey nests. The use of nest eggs encourages production but smelly medicated eggs should not be used.

The eggs should be gathered at frequent intervals during the day to prevent chilling. Store eggs in a dry place, free from draughts, and at a temperature of 45 to 55 degrees F. A well ventilated cellar is ideal.

An egg crate should be procured for the purpose. The crate protects the eggs from direct draughts. Draughts cause rapid evaporation of the moisture in the egg and reduce hatchability. The egg crate may be turned on its side and from one side to the other once or twice daily, as turning the eggs insures higher hatchability.

Eggs should not be subjected to strong odors, such as keroscene, onions, disinfectants, etc. Do not keep eggs longer than ten days before setting.

Select only normally shaped good-sized eggs with good shell texture for incubation. Eggs having transparent spots, or checks or cracks in the shell allow excessive evaporation and will not hatch.

Incubation of Turkey Eggs

There is a choice of two methods of incubation of turkey eggs, "natural" and "artificial." Each method has its advocates and followers, some claiming that natural or hen-hatched poults are stronger and healthier, while others claim the same for poults hatched in the incubator or by artificial methods. However, this is a debatable question and has not been proved in favor of one or the other. Where only a few poults are to be raised the natural methods will serve the purpose. Turkey hens cover 15 to 20 eggs depending on the season, temperature, and size of hen. Chicken hens are given 7 to 10 turkey eggs.

Arguments against the natural method are numerous:

First, the success of the venture depends upon the mood or temperament of the hen.

Second, the number raised by this method is very limited.

Third, when the hen is being used to incubate eggs she is not available for continued production of more eggs.

Fourth, natural methods throw the young poults in company with the mother hen which is likely to result in infestation with parasites, both internal and external, and also exposure to various poultry diseases. Where hens are used to incubate turkey eggs they should be thoroughly dusted with sodium flouride at the time they are set on the eggs. This should be repeated a week before the hatch is expected to come off.

By the use of artificial methods all of these difficulties are overcome. Where large numbers are to be raised it is necessary to use the incubator. By the use of the incubator larger numbers of one age and size can be raised at one time, thus producing more uniformity of growth. Where different ages and sizes are run together in the same lot, the smaller ones are crowded away from the feed and become stunted and never do catch up. The use of artificial methods shortens the brooding season and saves labor.

Operating the Incubator

Regulate the incubator and operate at the desired temperature a few days prior to putting the eggs in. Good results are obtained by starting the incubator at a temperature of 101 to 101½ degrees. When the eggs are placed in the incubator shut it up and forget about it for 24 hours. This will allow time for the eggs to reach the desired temperature. Do not attempt

to change the regulator once the eggs are placed in the machine. Any change of temperature needed should be made by the flame. It requires 28 days for turkey eggs to hatch. Candle on the 10th and 20th day and take out the infertile eggs and those having dead germs. Turkey eggs require considerable moisture. Some have good success by sprinkling the eggs with lukewarm water for at least the first half of the incubation period. Moisture may also be added by the use of the sand tray or by placing a plate of moist sand under the egg tray. Close the incubator on the 27th day and darken the window, leaving it closed until the hatch is completed, which

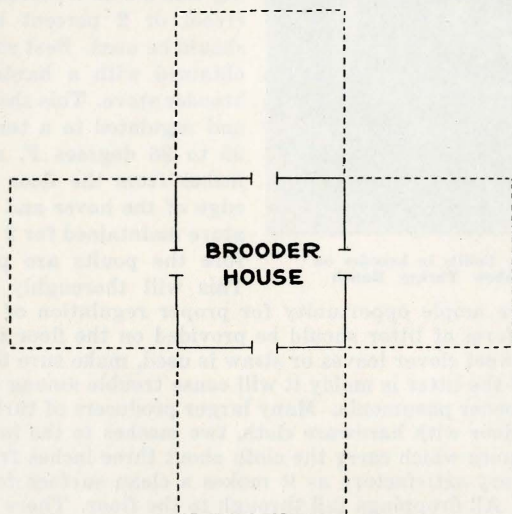


Fig. 5. The dotted lines indicate temporary or movable fences used to rotate grounds around brooder house. These may be constructed of lumber like large gates or 4-foot poultry fence. This arrangement may be modified to suit local conditions. Poults are kept in these yards until they no longer require artificial heat, then they should be transferred to the rearing grounds. They will then be six or eight weeks old depending on the weather and time hatched.

should be on the 29th day. Leave the poults on the egg tray until they are thoroughly dried off when they may be dropped into the nursery tray and the egg tray removed. They may be kept in the nursery tray until they are 24 to 36 hours old or until they appear strong enough to be placed under the brooder.

Hatch early. April or May hatched poults will be more profitable than those hatched later. June or July poults are handicapped by the excessive warm weather during their growing period and seldom are sufficiently developed by market time in the fall.

Brooding

One of the most essential pieces of equipment for making a success of turkey raising is a good brooder house. Blueprints of the brooder house advocated by the Farm Engineering department of South Dakota State College may be obtained at small cost. The brooder house should be at least 10 feet square or 10 x 12. A house of this size provides sufficient room for one of the larger sized hovers and also sufficient room for the attendant to

work efficiently. The house should be built on skids. This makes the house portable and it can be easily moved from one piece of ground to another, thus allowing the practice of rotation. If the brooder house has been used for poultry of any kind before, it should be thoroughly cleaned and dis-



Fig. 6. Poults in brooder on Rainbow Turkey Ranch

infected before being used for poults. All litter should be cleaned off the floor and the floor scrubbed with hot lye water using one can of lye to 35 gallons of water. Following this a 5 to 7 percent solution of cresol or 2 percent carbolic acid should be used. Best success will be obtained with a hardcoal burning brooder stove. This should be set up and regulated to a temperature of 95 to 96 degrees F. at a point 2 inches from the floor at the outer edge of the hover and this temperature maintained for 2 or 3 days before the poults are put under it. This will thoroughly dry out the house and give ample opportunity for proper regulation of the temperature. Some form of litter should be provided on the floor of the house. If alfalfa or sweet clover leaves or straw is used, make sure that it is free from mold. If the litter is moldy it will cause trouble among the poults in the way of brooder pneumonia. Many larger producers of turkeys are now covering the floor with hardware cloth, two meshes to the inch, stretched on wooden frames which carry the cloth about three inches from the floor. This proves very satisfactory as it makes a clean surface for the poults to be kept on. All droppings fall through to the floor. There is no danger of mold. This floor covering also prevents considerable loss in crowding as when the poults do crowd those which are at the bottom of the pile receive air from below and many more survive than would otherwise.

Due to the natural timidity of young turkeys, they are more apt to crowd than are baby chicks. This trouble can be relieved to some extent by preventing floor drafts. A piece of prepared roofing about 18 inches high and of sufficient length to make a complete circle about 18 inches to 2 feet from the outer edge of the hover is good for this purpose. It would be advisable to cut this roofing long enough so that it can be expanded as the poults grow and need more room, and finally can be tacked across the four corners of the brooder house, thus preventing crowding in the corners, which frequently occurs. Care will have to be exercised to prevent the poults flying over this paper and crowding behind it, thus being kept away from the heat. It should be removed before the poults are large enough to fly upon it. Crowding at night has been controlled by providing a light during the night.

As the poults are placed under the hover, they are given their first drink by dipping their beaks in slightly warmed water. They are then placed at the edge of the hover near the water dishes which they will soon find when they want another drink. A sufficient number of watering utensils should be provided to avoid crowding. If a continuous supply of milk

or buttermilk is available it is a valuable addition to the ration and may be used instead of water for the first few weeks.

Feeding Poults

No hard and fast rule can be laid down in regard to the feeding of poults. Good results are obtained with a wide variety of rations and methods, in fact, the baby poult is very similar to the baby chick and can be fed and handled in much the same way. Where large numbers are raised, one of the specially prepared commercial turkey starters will give very good results. The cost of the starting food is not excessive for the reason that the young poults consume very little up until the time they are 5 to 6 weeks old. Home mixed rations can be used providing the proper ingredients, such as hullless oats or oat flour and dried buttermilk, etc. can be obtained. A ration made up of the following is very satisfactory:

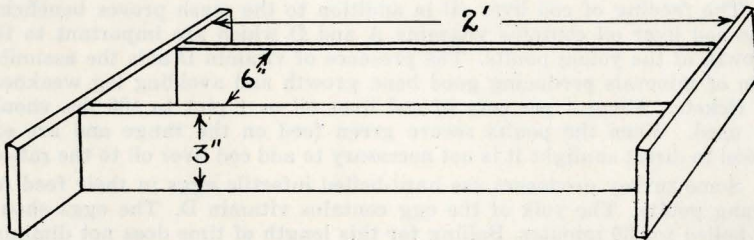


Fig. 7. Mash hopper suitable for feeding poults for first few weeks. (Six inch shiplap is used in construction)

- 20 lbs. yellow corn meal
- 20 lbs. wheat bran
- 20 lbs. of shorts or fine wheat middlings
- 20 lbs. ground hullless oats or oat flour
- 10 lbs. fine meat scrap
- 5 lbs. dried buttermilk
- 1 lb. salt
- 2 lbs. fine charcoal
- 3 lbs. bonemeal

The Wisconsin all mash ration can be fed with good success to poults. It consists of the following:

- 80 lbs. yellow corn meal
- 20 lbs. standard wheat middlings
- 5 lbs. high calcium lime rock (chick size)
- 5 lbs. raw bone meal
- 1 lb. fine salt

All the skimmed milk or high grade buttermilk the poults can drink should be provided at all times. Condensed milk in right dilution can be used.

A variation using only 60 lbs. of corn; 20 lbs. of bran; and 20 lbs. of standard wheat middlings and other ingredients as given is fed with good results. No change is made in the Wisconsin grain mixtures or the method of feeding during growth until fattening.

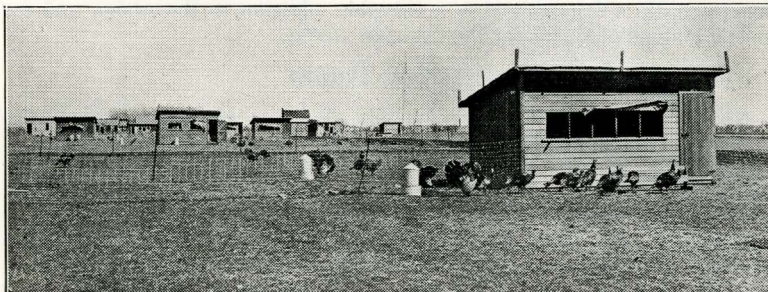


Fig. 8. A well laid out turkey ranch. Note the semi-confinement system of yard is practiced.

The feeding of cod liver oil in addition to the mash proves beneficial. The cod liver oil contains vitamins A and D which are important to the growth of the young poults. The presence of vitamin D aids the assimilation of minerals producing good bone growth and avoiding leg weakness or rickets. About 1 per cent of cod liver oil or 1 pint to 100 lbs. should be used. When the poults secure green feed on the range and are exposed to direct sunlight it is not necessary to add cod liver oil to the ration.

Some turkey producers use hard-boiled infertile eggs in their feed for young poults. The yolk of the egg contains vitamin D. The eggs should be boiled for 30 minutes. Boiling for this length of time does not diminish the food value of the egg and will kill any germs which may be present within the egg or on the surface. The hard-boiled eggs should be mashed fine, shell and all, and mixed with the mash, feeding at the rate of 1 egg for each 20 to 25 poults at each feeding for the first 7 to 10 days. Cottage cheese is also fed to turkey poults with good success, also dry wheat soaked in milk and mixed with mash in about the same proportions. One difficulty with such feed is that it must be made up fresh daily to avoid a growth of mold which may cause digestive troubles. This involves considerable extra labor and where large numbers of poults are raised the commercial mixed mash will probably serve better.

On about the 7th day of feeding a scratch feed can be introduced. Scratch feed should consist of two parts of finely cracked yellow corn, two part cracked wheat, and one part of steel cut oats. Keep oyster shell before poults at all times in a separate hopper.

The grain is fed twice daily gradually increasing the amount each feeding until the poults are consuming about as much of the scratch grain as mash. This method of feeding is continued until the poults are 6 to 8 weeks of age. Then change gradually from the scratch feed to coarse cracked corn, whole wheat, steel cut or hullless oats, using the same proportion. The mash is changed slightly by substituting ordinary ground oats for the oat flour and increasing the meat scraps from 10 to 15 pounds, increasing the bonemeal from 3 to 5 pounds and omitting the cod liver oil.

Continue feeding this ration until a fattening ration is introduced in the fall. It is recommended that in addition to these grain rations a good alfalfa range be maintained.

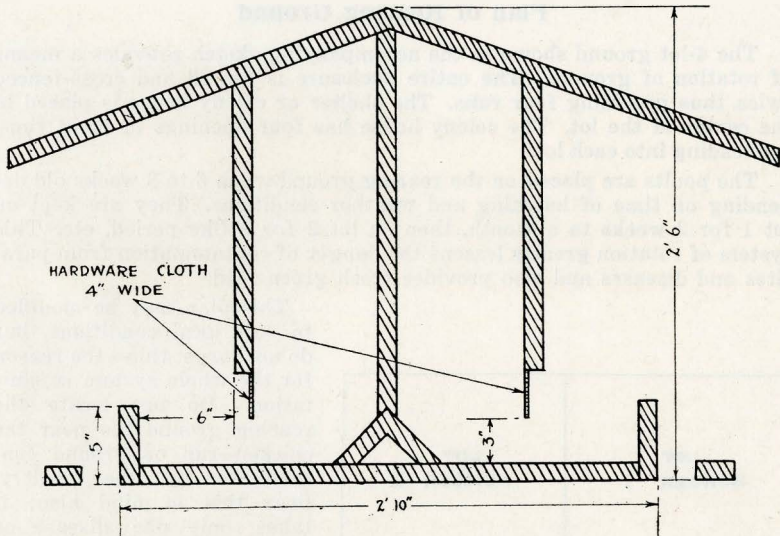


Fig. 9. Cross-section of Range Hopper

Summer Care of Poults

It is recommended in the chapter on sanitation to follow the semi-confinement method of rearing poults. The plot of ground used for this purpose, which we will call the rearing ground, should preferably be located in a corner of an alfalfa field. If this is not available, alfalfa, clover, thickly sown oats, or some forage crop should be sown to produce ample green feed for the growing poults. The size of the rearing ground will depend on the number of poults to be reared. A half-acre of good alfalfa sod will provide sufficient green feed for 200 or 300 poults until they are about 3 months of age. After this time, the rearing ground must be enlarged. In late summer, when the green feed in the rearing ground becomes dry and tough, it is advisable to supplement it with freshly cut alfalfa or some succulent green feed. The importance of green feed should not be overlooked, as due to the nature of the turkey they consume large amounts of green feed and a lack of it will result in retarded growth.

There is very little change to be made in the feeding ration of growing poults from the age of 6 weeks to 6 months. Continue hopper feeding of dry mash, containing about 15 percent of meat scrap. If plenty of skimmed milk is available, this amount of meat scrap may be reduced thus lowering the cost of the mash.

Continue feeding grain as previously mentioned. Hopper feeding of grain is recommended, as it is more sanitary than feeding on the ground and lessens the labor in caring for the poults. The hopper for feeding grain can be constructed similar to the diagram shown. This type of hopper can be provided with a water-proof covering and used out-of-doors thus conserving room within the colony house. There is no danger of the poults consuming too much feed, after they are 6 weeks old.

Plan of Rearing Ground

The 4-lot ground shown in the accompanying sketch provides a means of rotation of grounds. The entire enclosure is fenced and cross-fenced twice thus providing four runs. The shelter or colony house is placed in the center of the lot. The colony house has four openings or poult runs, one leading into each lot.

The poults are placed on the rearing ground when 6 to 8 weeks old depending on time of hatching and weather conditions. They are kept on lot 1 for 3 weeks to a month, then on lot 2 for a like period, etc. This system of rotation greatly lessens the danger of contamination from parasites and diseases and also provides fresh green feed.

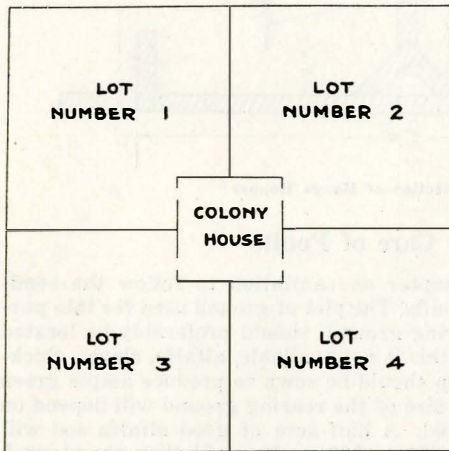


Fig. 10. The poults are placed here when six to eight weeks of age, depending on the weather. These four lots combined require about one acre of ground.

This plan may be modified to suit local conditions, but do not forget this—the reason for the whole system is sanitation. Do not locate the rearing ground too near the chicken run or ground contaminated by other poultry. Bear this in mind also; it takes only one disease or parasite-infested bird a very short time to contaminate a good sized tract of ground. Warm weather and summer rains are conducive to the development and spread of just such maladies as we wish to avoid.

As long as the poults are kept on clean ground away from chickens there should be no losses from blackhead, coccidiosis and other diseases. If an outbreak occurs, it is safe to say the soil was previously contaminated by infested chickens or other poultry.

This plan of confinement requires feeding the flock up to marketing. Do not yield to the temptation of turning them out into the fields after harvest. It is true they pick up considerable waste grain, but not enough to warrant the risk of their coming in contact with disease. The flock represents considerable value at this time and it will be cheap insurance to continue feeding them in confinement until marketing rather than to risk a serious loss for the saving of a few weeks' feed. Turkeys can exist with very little additional feed when given the run of the farm, but they will do a great deal better and make better gains when confined and fed properly and regularly on a balanced ration.

If turkeys are given the run of the farm and an outbreak of blackhead should occur, the disease organism would be spread over such a wide area

that there would be no clean ground to be used for a rearing ground the following year. As a result, turkey production would be impossible on that particular farm for several years.

Feeding and Preparing for Market

Early in October the breeders for the following year should be selected and separated from the birds to be fattened for market. There is usually a good demand for well grown, healthy breeding stock and it would be well to select a surplus for contemplated needs for sale. This applies especially to young toms.

In fattening turkeys for market an excellent plan is to begin about the first of October to feed heavy on a fattening ration containing yellow corn. A ration of equal parts of wheat, oats, and corn is fed during the first part of the fattening season, the amount of corn being gradually increased until the ration for the last week before killing consists of 60 to 75 percent corn. Old corn is a much better feed than new corn but it must be free from mustiness or mold. Confining turkeys too closely during the fattening season does not prove as successful as where they are allowed their usual amount of range.

It will be noted in the grades of market turkeys that much depends on the quality of fleshing on the breast and the amount of fat on the back. It will be well to use considerable care in selecting the birds to be killed for the Thanksgiving market. Unless the birds are in excellent condition it would be advisable to hold them over until the Christmas or a later market. Examine the birds by feeling of the fleshing over the breast. Pull back the feathers on the breast to learn the condition and growth of the pin feathers. If the condition of the bird reveals that many pin feathers will be left on the breast, it would be better to hold the bird over until the feathers are more mature and will dress out better. Oftentimes an increased profit can be realized by holding a bird over. This is due to three reasons. First, the bird held over for a longer feeding period will grade higher. Second, a well fattened bird will return a higher profit due to higher dressing percentage because of a better finish. Third, increased profits will result from adding additional weight to the bird. Figures show that turkeys on the fattening ration under ordinary conditions will put on one pound of weight for each five pounds of grain consumed. Even under ordinary prices for turkey meat, this will be a very satisfactory return for grain fed. The United States Department of Agriculture has in the past year held several turkey grading schools with the object of standardizing grades of dressed turkeys. Eighty percent of the grading on dressed turkeys is done on the condition of the breast of the bird. This in a way will explain the importance of proper feeding and care during the fattening period.

Dressing Turkeys

The exercise of proper care in dressing turkeys is an important factor in regard to the grade of the birds. Unless the birds are properly bled they will be graded as seconds on the market. Before being killed, turkeys should be deprived of feed for about 24 hours but given plenty of fresh, clean water in order to clean the crop and intestines of all feed. When

ready to be killed, the birds should be hung up by the feet. The bird's head is held in one hand and a sharp, narrow-bladed knife is used to sever the veins in the throat by making a small cut inside the mouth on the right side of the throat, at the base of the skull. After this cut is made and bleeding begins, the knife is thrust up through the groove in the roof of the mouth and into the brain at the back part of the skull. When the brain is pierced, the bird gives a peculiar squawk and the feathers are loosened. In dry picking the feathers should be plucked immediately and if the bird has been properly stuck they will come out very easily. The tail and large wing feathers are removed first, after which the body feathers are pulled out.

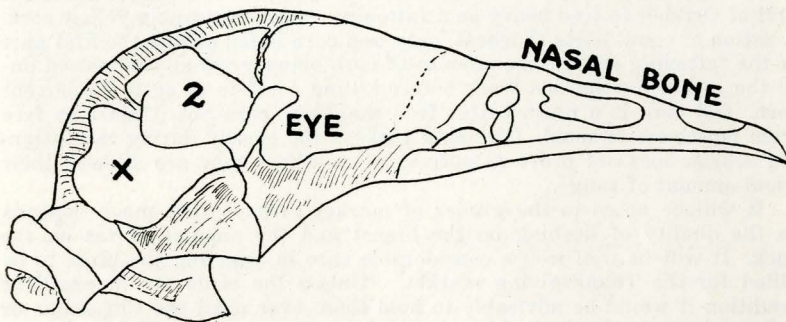


Fig. 11. The illustration shows the turkey skull. There are three parts to the brain. The third or last cavity, marked with the cross, is the part that contains the nerve center that controls the muscles. When this nerve center is destroyed, death occurs instantly, and the feathers are loosened. Too many make the mistake of sticking the knife too high in the head and not back low enough to pierce the proper section.

Dressed turkeys must be properly cooled before being packed for shipment. They should be hung up by the feet in such a way that one bird is not below another and in this way becomes soiled with blood. They must not be frozen before the animal heat has had a chance to get out. They should remain at a temperature of about 35 degrees in the open air for at least 24 hours. Freezing does not prove detrimental after the carcass has been thoroughly cooled, but if subjected to sharp, freezing temperatures immediately after being killed the outer surface freezes and the animal heat does not have a chance to get out. Birds treated in this manner will spoil in shipment and are known as "green turkeys". Much can be added to the profit from a flock of turkeys by the exercise of care in dressing, cooling, and packing.

Occasionally a bird is killed with considerable feed in the crop. In this case it is advisable to remove the entire crop intact. It is possible to do this through a slit in the skin of the neck and thus not disfigure the breast appearance. Make a slit about three inches long in the side of the neck along the margin of the fat which is well up toward the top, the slit extending to a point in front of the wing. Find the tube leading to the crop (esophagus) and by manipulation the entire crop can be removed, making a clean operation. The opening in the skin should then be sewed up using white silk thread. Following are the grades as worked out by the United States Department of Agriculture.

TENTATIVE SPECIFICATIONS FOR U. S. STANDARDS AND GRADES OF DRESSED TURKEYS

Quality Specifications of Individual Birds

Young Hen Turkeys

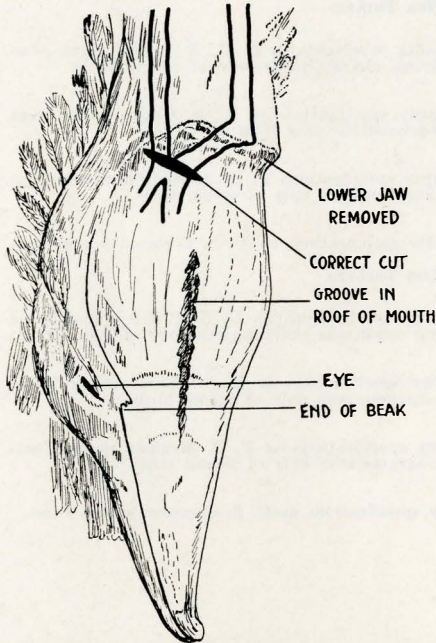


Fig. 12. This shows the head of the bird with the lower jaw removed; also the proper place to sever the jugular vein for good bleeding.

U. S. Prime or A. 1 Grade

Young, finegrained, soft-meated female birds, with broad, full-fleshed breasts, and with backs, hips and pin bones fully covered with fat. Must be well bled, well dressed and practically free of pin feathers, with no noticeable feed in crops. No flesh bruises allowed, and only very slight skin abrasions, bruises or discolorations permitted, none of which shall be on the breast. Slightly dented breast bones (not to exceed $\frac{1}{4}$ inch in depth) permitted, but no crooked breasts or other deformities allowed. Broken wings above the wing tip, or broken legs not permitted. Must be dry picked or semi-scalded and dry packed.

U. S. Choice or No. 1 Grade

Young, soft-meated female birds, with well-fleshed breasts, and with backs hips and pin bones well covered with fat. Must be well bled, well dressed, and may show some few scattered pin feathers other than on the breasts, with crops practically empty. Only very slight flesh or skin bruises, abrasions or discolorations permitted, none of which shall be on the breast. Slightly dented breast bones (not to exceed $\frac{1}{8}$ inch) permitted but no crooked breasts or other deformities allowed. Broken wings above the wings tips or broken legs not permitted. Birds, with crops properly removed may be permitted in this grade.

U. S. Medium or No. 2 Grade

Young, soft-meated female birds, with fairly well fleshed breasts, and with backs, hips, and pin bones fairly well covered with fat. Must be fairly well bled and dressed, and may show scattered pin feathers over the entire carcass. Crops must not contain over four

ounces of feed. Slight flesh or skin bruises, abrasions or discolorations permitted, but not more than three such defects to each bird. Abrasions or tears over three inches in diameter not allowed, except on the back or wings. Dented or slightly crooked breast bones or other slight deformities permitted. Broken wings below the second joint or broken legs below the flesh permitted.

U. S. Common or No. 3 Grade

Young female birds which may be poorly fleshed with backs, hips, and pin bones poorly covered with fat. May show evidence of poor bleeding and numerous pin feathers over the entire carcass. Crops may contain not over eight ounces of feed. Flesh or skin bruises, abrasions or discolorations permitted, but not such as to make any appreciable amount of the carcass inedible. Dented or crooked breast bones or other deformities allowed. Broken wings or broken legs permitted.

Young Tom Turkeys

U. S. Prime or A. 1

Young male birds of the same quality specifications as U. S. Prime young hens, except for fleshing conditions which must be exceptionally good for birds of this class.

U. S. Choice or No. 1

Young male birds of the same quality specifications as U. S. Choice young hens, except for fleshing conditions which must be reasonably good for birds of this class.

U. S. Medium or No. 2

Young male birds of the same quality specifications as U. S. Mediums hens, except for fleshing conditions which must be fairly good for birds of this class.

U. S. Common or No. 3

Young male birds of the same quality specifications as U. S. Common young hens.

Old Hen Turkeys**U. S. Prime or A. 1**

Mature female birds of the same quality specifications as U. S. Prime young hens, except for fine grained, soft-meated conditions characteristic only of young birds.

U. S. Choice or No. 1

Mature female birds of the same quality specifications as U. S. Choice young hens, except for soft-meated fleshing condition characteristic only of young birds.

U. S. Medium or No. 2

Mature female birds of the same quality specifications as U. S. Medium young hens, except for soft-meated fleshing conditions characteristic only of young birds.

U. S. Common or No. 3

Mature female birds of the same quality specifications as U. S. Common young hens.

Old Tom Turkeys**U. S. Prime or A. 1**

Mature male birds of the same quality specifications as U. S. Prime young Toms, except for fine grained, soft-meated fleshing conditions characteristic only of young birds.

U. S. Choice or No. 1

Mature male birds of the same quality specifications as U. S. Choice young Toms, except for soft-meated fleshing condition characteristic only of young birds.

U. S. Medium or No. 2

Mature male birds of the same quality specifications as U. S. Medium young Toms, except for soft-meated fleshing condition characteristic only of young birds.

U. S. Common or No. 3

Mature male birds of the same quality specifications as U. S. Common young Toms.

Diseases of Turkeys

One of the important problems confronting the turkey raiser is the control of diseases. It is very discouraging to raise turkeys up to almost the marketing age and then have them die as a result of some disease. Not many diseases occur in turkeys but those that do occur are virulent and it is not unusual to lose the entire flock. A large part of the losses may be prevented through proper care and management. Anyone who expects to raise turkeys must not forget that they take attention as well as other birds and animals and in order to prevent them from getting diseases they must be given attention from the standpoint of feeding, care and management, and sanitation.

Sanitation means to keep things clean. Sanitation helps to preserve the health of the birds. Cleanliness, sunlight, fresh air and disinfectants are the important factors in sanitation.

Germs Cause Diseases.—Diseases are caused by germs. Diseases do not spring out spontaneously as a result of the weather, wind or rain. Germs are definite living organisms and grow and reproduce just the same as plants and animals. The reason people do not always realize the cause of diseases is that germs are so small they can not be seen except through a microscope. Germs have certain characteristics; that is they will not live in sunlight; if kept away from sunlight they will live over from one year to another and they may be destroyed by heat or fire and by disinfectants.

Predisposing Causes—In addition to the actual cause of diseases there are other factors which help diseases get started. Anything that lowers the resistance of a bird makes him more susceptible to a disease. When birds are not properly fed or housed they may lose their resistance. If they are compelled to run over the same ground year after year they are predisposed to disease. If they are full of internal parasites they are fit subjects for contagious diseases. Young birds are more susceptible to disease than old birds. Contaminated and insufficient water puts birds out of condition. A lack of sunshine, poor ventilation, poor drainage or any other unsanitary condition helps the germs get in their deadly work. If birds were properly cared for a large amount of disease troubles could be eliminated.

Spread of Diseases—Disease is usually spread from one farm to another by being carried. When the size of the germ is considered this is easily understood. Probably the greatest carrier is the new bird. Any new bird that is brought on the place should be isolated for thirty days. When a disease breaks out the sick birds should be isolated. The droppings of sick birds are full of germs and these droppings contaminate the feed of other birds.

Feeds and Feeding.—Particular attention must be given to the cleanliness of feed. In about 90 percent of the cases of contagious disease the infection has been taken in by way of the mouth. The feeding of spoiled meat or dead animals to turkeys is dangerous and is liable to cause botulism or meat poisoning. The birds should be fed a variety of foods in order to balance the ration, and by all means let the feed be kept clean.

Soils—Many different kinds of germs live in the soil and the soil may harbor germs that cause disease. Very few disease germs will multiply in the soil but will simply lie dormant until given a chance to get into the body of some bird. The pollution of the soil takes place in various ways

but the greatest danger is from manure. Droppings from chickens leave the organism that causes blackhead in the soil for the turkeys to pick up. For this reason it is extremely important for turkeys to have clean range each year.

Disposal of Manure.—If turkeys are kept in a house the droppings should be regularly cleaned out and hauled to the garden or field where the turkeys do not run. All contaminated litter should be dealt with likewise or burned. Every cause of contagious disease is started by the transfer of infection from one bird to another and the main object of sanitation is to break this connection. In many cases of contagious diseases germs are thrown off by the millions in the droppings of the sick birds. The proper disposal of manure is important at any time but if a contagious disease exists it is of extreme importance.

Turkey Houses.—From a sanitary standpoint portable houses are more satisfactory than permanent houses. One of the first essentials in raising turkeys is clean range; therefore the turkey house should be movable. Many of them are built on skids. The floors and wall should be easily cleaned. Provision must be made for ventilation, but ventilation does not mean draft. Turkeys are subject to roup and drafts help roup get started.

Disinfectants and Disinfection.—Disinfectants are agents that kill bacteria or germs, especially those that cause diseases. Nature has provided a very powerful disinfectant in sunlight. The direct rays of the sun will kill many germs. The combination of sunlight and fresh air acts as a powerful disinfectant. Boiling water is not necessarily a disinfectant, but when used in combination with lye becomes very useful as a cleanser. Cold as a disinfectant is not a success and will not kill germs. Lime is used as a disinfectant in several different forms. Fresh lime is used by being thrown around or sprinkled on the walls, floor and ground in the lots. The most common form in which lime is used is in the form of whitewash. Whitewash acts as a very good medium for the application of disinfectants. Carbolic acid may be added to whitewash to the extent of five per cent. Cresol is probably the most useful disinfectant about the poultry house. It is a much better disinfectant than carbolic acid. It can be bought in the form of a compound solution of cresol or under such trade names as lysol or creolin. Any of these cresol solutions mix well with soft water and a four per cent solution is the most desirable.

A thorough cleaning is the first step in disinfection. Dry sweeping or dusting is dangerous on account of the germs in the dust, and all surfaces should be wet down before sweeping or scraping. Manure should be hauled out on ground that is to be plowed where no birds will come in contact with it. Eating utensils such as troughs must be scalded with boiling water. The poultry house should be thoroughly soaked with a strong solution of cresol applied by a spray pump. After this thorough soaking the floors and dirty walls should be swept and scraped. The floors should then be scalded with hot lye water. After the building is aired out for a few days a coat of whitewash should be applied. The ground in the immediate vicinity of the building should be cleaned and then turned over with a plough or spade in order to give the sun a chance.

Quarantine.—The isolation of the sick birds is the first principle in controlling any contagious disease. As soon as a bird is noticed to be off feed or comes up behind the flock, he should be put in a pen or coop to himself. The sick bird should be kept in this quarantine pen until he gets

well, dies, or is otherwise disposed of. After the bird is removed, the quarantine pen should be cleaned and disinfected.

Disposal of Carcasses.—There is only one proper method to dispose of a dead bird and that is to burn him to ashes. It is a serious mistake to throw the carcasses of dead turkeys to the hogs. If the birds should happen to die of blackhead, the disease is distributed around wherever the hogs may go. It is an easy matter to burn a dead bird on most any kind of a fire. Burying is all right if it is properly done, but too many times the carcasses are not buried deep enough.

Blackhead

No other disease causes as great a loss to the turkey industry as does blackhead. This is a very old disease and has followed the turkey industry from its beginning in the eastern part of the United States to the western part. It has been found by experience that where turkeys are raised year after year on the same ground, sooner or later blackhead gets into the flock. The disease is not properly named as the term blackhead does not describe the disease and is merely a symptom. Most any bird that gets sick with any kind of disease might have a black head.

The disease is caused by a germ that is carried more frequently from one bird to another through the medium of round worms. Chickens may carry this infection around with little effect, but when they distribute the worms on the range where the turkeys run the turkeys pick this infection up by having the feed contaminated with the droppings from the chickens. Of course, this is not the only way that blackhead may spread from one bird to another, but it is the most common.

The disease is characterized by producing a listless bird. The bird refuses to eat and comes up slow behind the rest of the flock. Possibly a diarrhea is present. The droppings have a yellowish or greenish-yellow tinge. Most of the birds that are affected with this disease will die. These symptoms are not very definite but are about all that are present. The real way to diagnose blackhead in turkeys is to kill one of the sick birds and open it or open one of the dead birds. A close examination should be made of the liver. If the liver is enlarged and covered with white spots varying in size from a pin head to even as large as a dollar, the disease is generally safely diagnosed as blackhead. This disease may also produce an inflammation of the caecum or "blind gut". It is in this "blind gut" that the disease really starts and the germs are then carried to the liver. The disease is more prevalent in young birds than in old.

There is no cure for blackhead. Much can be accomplished from a preventive standpoint. If blackhead has never been present in the flock the owner should use extreme precaution in keeping it out. A system whereby the birds run on clean ground every year is very important. It has been found by experience that there will be much less blackhead in turkeys if they do not run with chickens. Because the chickens pass off these little worms that carry the germ of blackhead. When turkey eggs are bought, they should be secured from flocks that are free of this disease. If the eggs are hatched out under chickens the poults should be removed to a brooder in a very few days after hatching.

As far as any treatment for the sick bird is concerned, it is practically useless. It might be advisable to put an antiseptic in the drinking water for the rest of the birds if the disease breaks out. A common inter-

nal antiseptic is potassium permanganate. This comes in the form of crystals and can be secured from any drugstore. Put what will lie on a dime in a gallon of drinking water. Some turkey raisers say that they believe the feeding of sour milk to the turkeys has a tendency to limit the amount of blackhead.

Tuberculosis

While tuberculosis is not as common in turkeys as it is in chickens, it is unfortunately a problem. This disease is also caused by a germ and is spread from one bird to another largely through the droppings. Here is another case where it is dangerous to let the turkey run with the chickens. These germs that cause tuberculosis will die if exposed to the sunlight, but when they get covered with dirt they will live for some time.

Turkeys that have tuberculosis will show a lack of thrift, become emaciated and finally die as a result of this infection. However, this disease does not go through a flock as rapidly as does blackhead, but might be confused with blackhead. A positive diagnosis is made by a postmortem examination. The liver may show some white spots but they are probably more numerous and not so large as in blackhead. Also in tuberculosis these little nodules may be found on the intestines which is different from blackhead.

Tuberculosis is controlled by destroying all the sick birds and removing the well birds from the infested premises. Sanitary measures as formerly described are very important in connection with controlling tuberculosis. This disease is more prevalent in the old birds than in the young.

Roup

Roup is not as common in turkeys as it is in chickens. The young birds seem to be more subject to the disease than the older birds. The exact cause of roup has never been determined, but it is probably caused by some infectious organism the same as other contagious diseases.

The first symptoms of roup are those of a common cold and later a swelling usually develops just below the eye. Roup is very contagious from one bird to another.

Some of the birds may get well with the proper kind of treatment. It takes considerable patience to treat the birds individually but it will be necessary in order to secure results. If there is a swelling under the eye, it should be opened and the material squeezed out. The head of the bird can then be dipped in hydrogen peroxide. In many cases it is advisable to kill the bird rather than attempt to treat it. The sick bird should always be kept away from the rest of the flock.

Limberneck

This disease is produced by a poisoning and is common after the birds have been fed decomposed meat or spoiled grain.

A dose of 15 drops of turpentine and a teaspoonful of castor oil mixed may be administered. All decomposed feed should be removed.

Coccidiosis

While this disease is not common in turkeys it may occur. It is caused by a coccidia. The organism may live in the soil for a year and enters the body through the feed and water. Its main seat of action is in the caecum or "blind gut" where it causes a severe inflammation. Naturally this is characterized by a diarrhea.

Treatment is very unsatisfactory in most cases. Epsom salts may be added to the mash at the rate of 1 pound to 100 pounds of feed. Precaution should be taken to prevent the disease from getting started. A rotation of range will help prevent an outbreak.

Fowl Cholera

Fowl cholera is a form of hemorrhagic septicemia. It is not a primary disease, but occurs as a secondary disease after the bird's system has been weakened by some other condition. The germs that cause fowl cholera are present on most every farm, and when the conditions are right they get into action. These germs have the power of increasing in virulence and as they pass from one bird to another they become more virulent and will act quicker.

The symptoms of fowl cholera are an unthrifty condition and a very profuse diarrhea. The birds may linger several days before they die. Upon opening a dead bird hemorrhages may be found on most any of the organs and quite an extensive inflammation of the intestines.

All sick birds should be destroyed immediately. There is no treatment for a bird with fowl cholera. Remove all well birds to clean grounds and disinfect the premises where they have been. Use an internal antiseptic such as potassium permanganate in the drinking water for the well birds. Vaccination against this disease is in the experimental stage.

Tapeworms

Tapeworms are white flat worms made up of a number of segments that give them a jointed appearance. There are at least four or more species that occur in turkeys. Tapeworms are spread from one bird to another by a snail acting as the intermediate host. Common house flies may also act as intermediate hosts. The disease can generally be quite definitely diagnosed by making a postmortem examination and finding the tapeworm present.

Probably the most effective treatment for tapeworms in turkeys is the use of the drug known as kamala. Capsules or pills can be purchased at most any drugstore, or if they are not kept on hand, the druggist can secure them. The dose is one gram of kamala for each bird. Especially large birds may be given two doses.

Roundworms

Roundworms occur in turkeys in two different sizes, that is, the common roundworm and the small hair-like worms. These worms can be easily recognized on postmortem examination. The common roundworm occurs mostly in the intestines proper while the small worms occur in the caecum.

The best treatment for worms at the present time is probably nicotine sulphate. These nicotine sulphate capsules or pills may be purchased at most any drugstore. The use of these pills will necessitate individual treatment which is by far the best kind of treatment. Tobacco dust is also used to treat birds for worms. Tobacco dust can be purchased at the drugstore and is added to a dry mash, one pound of tobacco dust to fifty pounds of mash. This treatment can be continued for a couple of weeks.

Summary of Diseases

Diseases are caused by germs and in many instances the bird's resistance is lowered by some outside condition. Diseases spread largely through contaminated feed, that is, the droppings of one bird contaminate the feed of another. In order to build up the resistance of a bird, he must be given the proper feed at the right time and plenty of drinking water at all times. All poultry droppings should be removed to a field that is to be plowed up and where turkeys do not run. The turkey house should be so built that it has a solid floor, is easily cleaned, and has a reasonable amount of sunlight and ventilation without drafts. All sick birds should be isolated and dead birds burned to ashes. Blackhead is best controlled by a frequent change of runways. Tuberculosis may be prevented by keeping turkeys away from infected chickens and by proper sanitary measures and by the treatment of individual birds.

General Summary

Sanitation is the key-stone in the arch of success in raising turkeys. Artificial methods of hatching and brooding are more adapted to a sanitation program than are natural methods.

Build a good substantial brooder house on skids and move it to clean ground each year.

Procure a good reliable brooder stove with sufficient capacity to provide ample heat.

Avoid crowding of a larger number of birds than the house will adequately accommodate.

Use only standard bred, well matured, healthy, vigorous birds as breeders.

Hatch early, not later than June 15th. Late hatched poults seldom prove profitable.

Keep growing birds free of parasites, external and internal.

Feed a balanced ration in sufficient quantities at all times. Well fed birds develop a natural resistance to disease. Minerals and water are essential parts of a balanced ration.

Birds to be marketed should be well fattened and finished.

Learn to kill, dress, cool, and pack birds properly to produce high grade market turkeys.

To be successful in raising turkeys one must consider the enterprise of sufficient importance to provide the necessary equipment to follow all the practices outlined in this circular.

It is not enough to do only a part of them.

Remember that success in turkey raising is very largely a question of proper management.

BIBLIOGRAPHY

Jull M. A. and Lee A. R., Turkey Raising Bulletin 140A, U. S. Dept. Agriculture.
Billing W. A., Talking Turkey Bulletin, Agriculture Extension Div. University of Minn.
Musschl F. E., Turkey Production—Circular 34, Nebraska Experiment Station.
Herner M. C., Turkey Raising, Extension Bulletin 81, Manitoba Agricultural College.
Hayes J. B. and Annin, G. E. Raising Turkeys in Wisconsin, Extension Circular 231, College of Agriculture, University of Wisconsin, Madison.

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