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## POULTRY RAISING

BY

W. E. VAPLON

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# The Agricultural Experiment Station

FORT COLLINS, COLORADO

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# POULTRY RAISING

By W. E. VAPLON

The call for information relative to conditions for successful poultry raising in Colorado has become so great that it seems necessary to issue a bulletin of general information which can be sent in answer to inquiries.

The information here given is not the result of experimentation on the College farm, but of several months of investigation reaching to all parts of our State among expert poultrymen, added to the experience of 'fifteen years' work with poultry in Colorado by the writer.

While we hope this bulletin will be an encouragement to those expecting to raise poultry on a commercial scale, we also hope that it may disillusionize some who are being carried away by fables of immense profits derived by using get-rich-quick systems. Enthusiasm is a splendid factor in poultry raising, but should be tempered with knowledge.

## *LOCATION OF THE POULTRY FARM.*

In discussing the matter of choosing a location for a poultry farm, we are not considering the farmer who is already established on his land, and to whom the hen is only a side issue, but rather the man or woman who is intending to make poultry raising or egg production the means of livelihood. Success may, and often does depend upon location, and once decided upon, a change is not easily made. In the choice of a location the following factors should be carefully considered;

Nearness to market.

Character of soil.

Water supply.

Convenience.

Cost of land.

*Nearness to Market.*—To produce large numbers of eggs is only half of the poultryman's problem, he must be able to market his products cheaply at a good average price to make a profit, hence nearness to market, or good transportation facilities, are important considerations. The Colorado poultryman is very fortunate as to markets, as it is doubtful if there is a community in the State which furnishes its own poultry products for the entire year. Our mining towns, health re-

sorts and large cities are entirely dependent upon outside sources for their supply. About four millions of dollars' worth of poultry products are shipped into Colorado annually, and every dollars' worth should be produced at home. This means that practically all the output of our silver mines goes to neighboring states for poultry products.

*Character of the Soil.*—While it is true that poultry will do well on any of our soils, it is also true that soils best adapted to general farm crops give best results to the poultryman. The soil should be porous enough to dry off quickly after a rain, but heavy enough to produce good crops of vegetables, alfalfa, grain, berries or any crop desired, these crops to be used for the poultry, or as added sources of income. This character of soil can be kept cultivated with less labor than heavy clay soil, thus insuring clean, sweet range for the fowls. While it may be true that grain can be bought as cheaply as it can be raised, we believe that it would be advisable to grow some of the grain used if possible, if only for the added value of the straw thus produced. We find that our poultrymen are inclined to be rather chary in the matter of litter for their fowls, as one will naturally be where straw is as expensive as it is in some portions of our State. Especially if the land is level should it be somewhat sandy, as heavy clay soil, when frequently wet, soon becomes filthy by reason of becoming packed.

A south slope is ideal on account of drainage and sunny exposure. A north slope is undesirable and wet land should never be considered.

*Water Supply.*—No other water system can equal a living stream or spring, and if the fowls can help themselves at will, so much the better for them and for their keeper also. Every device or convenience that lessens labor, especially if it costs little or nothing, means so much more profit, and carrying water to a large number of fowls is certainly very expensive by reason of the time and labor consumed. Where water is furnished, cleanliness should be carefully observed. Galvanized iron or stoneware drinking vessels are preferable. Wooden troughs are objectionable because they furnish lodgment for disease germs. The water dishes should be kept clean, and be frequently replenished with fresh water. During warm weather the water should be kept in a shady place to keep it as cool as possible.

*Convenient Arrangement.*—In all the work of selecting a location, building, fencing, etc., the matter of convenience should never be lost sight of. The relation of each building to all the others, to the roads and highways, and to the residence, should be very carefully considered. Convenience means a saving of time and labor, which means added profits. The usual way of building each new poultry house in the most convenient place left vacant, without refer-

ence to those that may follow, will mean many unnecessary steps, discomfort and dissatisfaction. Lay out your plant as though you expected at some future time to have your entire farm, whether large or small, devoted to poultry. Whether you expand to such proportions or not, if you have planned wisely, you will be saved much annoyance and labor and your work will be better done.

*Cost of Land.*—How much to pay for land must depend largely upon the object in mind in engaging in poultry raising.

If the intention is to supply both poultry and eggs to the consumer, thus necessitating weekly or semi-weekly trips, it would be advisable to pay more for land in order to get nearer to market, and use less acreage. Time is money, and long drives take time. On the other hand if the intention is to wholesale the products, and make eggs the primary object, or perhaps to employ the colony system of housing, it would be advisable to buy cheaper land farther from market and ship the products by train. With daily mails, telephones and fast trains, one can easily keep in touch with the markets; and while the prices received would be less than in retailing, the cost of production and delivery would also be less, and the net profit would perhaps be about the same.

### BREEDS.

We have no space to take up the history of our various breeds. We wish to aid the beginner to choose the right breed of fowls for his or her special purpose, and from a commercial standpoint the choice necessarily falls upon the so-called "general-purpose" fowls, commonly classified as the American breeds, or upon the so-called "egg breeds"—the Mediterraneans and other smaller fowls.

*General Purpose Breeds.*—Under this head will come the different varieties of Plymouth Rocks, the Wyandottes, the Rhode Island Reds, and the Orpingtons. These breeds are spoken of as "general purpose" because they answer the call for a fowl which will give the owner an early broiler, a plump, good-sized roaster, and also a goodly number of eggs in the course of a year. Where the intention is to furnish both eggs and fowls for the market, and especially where one can sell directly to the consumer, no mistake can be made in selecting any variety of any of these breeds. Perhaps the variety chosen should be the one most nearly pleasing the fancy of the individual.

*Egg Breeds.*—Almost invariably where "eggs for the market" is the principal object of the poultryman, one of the smaller breeds is chosen, and usually the Single Comb White Leghorn is the variety. Often where the object is "eggs and broilers" the same variety is chosen, as the chicks come to broiler size, one to one and a half pounds, nearly as quickly as the larger breeds.

For roasters they are found wanting, nor do we believe it will pay to raise any chicken to roaster size in Colorado until our markets will pay as much per pound for a roaster as for a broiler. As it is now, a broiler worth fifty cents will bring no more if kept to twice the size and weight at an added expense and risk, and sold as a roaster. Our poultry raisers are mostly to blame for this, as no attempt is made to finish their products nor to educate the consumer's taste to the tooth-someness of a fine, plump, specially fattened roaster.

Other varieties of Leghorns, the Brown and Buff especially, are quite popular in certain localities and furnish the same white egg and yellow carcass as the White. The Minorcas and Black Spanish, Anconas, Hamburgs, Polish, and many others might be mentioned as belonging to this class or type, but on a large scale from a commercial standpoint, a beginner had better stick to the better known and more popular varieties.

*Meat Breeds.*—The feather-legged Asiatics, the Langshans, Cochins, and Brahmas, weighing when mature seven to twelve pounds, are generally classed under this head. In the East, where large roasters and capons are in demand at certain seasons at good prices, these varieties are profitably raised for their flesh, but the reason we gave in the preceding paragraph for not raising poultry in our state for the flesh, will bar these larger breeds for the present from our commercial poultry farms.

*Choosing a Breed.*—Until our people wake up to the great possibilities of poultry keeping in Colorado, the advantages of soil, sunshine, foods and markets, that we possess; and until each community produces more than it consumes, and has a considerable amount to send out, the matter of choosing a breed is very much a matter of personal preference; but when Colorado as a State produces eggs and poultry for export, we must make choice of a breed or variety that will produce a uniform product in order to get the best prices.

#### FEEDING.

A hen craves and seeks a variety of food, and must have it to be healthy and profitable. If the hen has free-range, grain is all that need be provided during the summer, as she can find sufficient vegetable and animal foods. In the winter, and also if confined in summer, everything must be provided. The nearer we can come to providing just the right proportion of these foods, the nearer we come to an economical and balanced ration.

*Hopper Feeding.*—It would be easy to provide a balanced ration by giving her free access to hoppers containing all these different foods, but we must not forget the matter of exercise. On free range,

a hen will seldom overeat of grain, even if it is kept before her all the time. Hunting worms, bugs, grasshoppers, etc. affords her the necessary exercise to keep her in good condition; but in close confinement, especially in cold weather, exercise should be provided as carefully as food. Confinement does not hurt the hen, it is really much better during cold and stormy weather than freedom, but she must have something to do. Every inch of the floor space should be clear for her use, covered deep with straw or other clean litter, and all grains should be scattered in this to induce scratching. A busy hen is a healthy hen, and only a healthy hen is profitable.

*Grains.*—All grains are good, but a steady diet of any one grain is neither good nor economical. Where milo and Indian corn can be most successfully grown, these can be made the principal grain feed, but a hopper of dry bran kept before the fowls all the time and occasionally a feed of wheat or oats, even if comparatively high in price, will be found beneficial and economical. Cooked beans and cracked peas are a splendid addition to the grains and are cheaply grown. In most sections of Colorado, however, wheat, corn and oats will be found cheap enough to use largely, and a poultryman will find that it will pay well to lay in a winter's supply of wheat and oats at threshing time, as the price usually advances twenty-five per cent. or more later in the season.

*Animal Food.*—Something should be provided to take the place of the worms and insects so relished by the hen on free range. Green bone and meat scraps from the butcher, and blood meal from the packing house, the flesh and bones of any farm animal, all are rich in those elements necessary for growth and for egg production. An old cow, no longer profitable for milk production, may be worth more as egg material than for beef, and a horse worn out or crippled will make the finest addition to the grains. Fresh cut bone and beef scraps can usually be procured at a fair price, but where meat is not easily obtained and the prepared foods are expensive, milk in some form will be found to be a satisfactory substitute.

*Green Foods.*—During the winter if the fowls are confined, we are apt to overfeed with the grains, and under feed with the more succulent vegetable foods. Alfalfa leaves, either dry or steamed, make as good a green food as we can furnish. So good is it, that eastern poultrymen are paying as high as \$65 per ton for cut alfalfa, which is not as good as the leaves, as all the hay is used in making it. Any of the root crops, sugar or stock beets, turnips or carrots, cabbage, potatoes, onions, waste apples, would be equally welcome and beneficial to the fowls.

It pays to keep a supply of grit, oyster shell and charcoal before

the fowls. The more you can coax your laying hen to eat and assimilate, the more material will she have to turn into eggs. Her body must be nourished and material supplied for eggs. To provide for both purposes during cold weather means grinding up a great deal of food. The grit helps to do this and the oyster shell furnishes material for the egg shell. Charcoal furnishes no nourishment but promotes digestion, and is a bowel corrective.

*Nutritive Ratio.*—A poultryman should know the approximate food value of his feeding stuffs in order to supply the necessary nutrients at the least cost. No one has yet proven the superior value of wet or dry mash, and whether or not you keep a hopper of dry, ground grains before your fowls, they will occasionally relish a moist, steamed mash of vegetables and ground grain, seasoned as you would like it for yourself. Let the morning meal in winter be cracked grain of some kind in the litter, and feed the mash either at noon or in the evening, and never more than they will clean up. We have as yet found nothing more gratifying to our fowls for supper than corn, either whole or cracked, and this should be fed in clean straw, or in such a manner that the fowls must use some energy in digging it out. When you find your hens becoming anxious for their meals is the time to feed rather than at some fixed hour.

*Feeding Chicks.*—What we have said about feeding fowls can be applied to the chicks, when they get hungry do not withhold food because a certain time has not elapsed. Some of the brood will eat very heartily, some not at all and a little prepared chick feed, rolled oats, bread crumbs moistened with milk, or a hard boiled egg, will certainly do no hurt to the hungry chick. It may be possible to raise them without water, as some advocate, but we cannot understand how anyone who has ever seen the little fellows pile into a water dish can withhold this from them; so provide cool, clean water and milk in any form in clean dishes. What applies to the hen applies also to the chickens, variety and plenty with exercise. For a few days the chicks should be fed regularly, after that much time and labor may be saved by having plenty of cracked grain in fine litter (alfalfa leaves are good) where the chicks can get it at any time.

Bear in mind in poultry raising that cleanliness is one of the necessary factors for success. Cleanliness of buildings and coops means freedom from vermin. Cleanliness of yards and runs will be a more or less difficult matter depending upon how your plant has been arranged and upon your methods of housing and yarding. When many fowls and chicks are kept on a small acreage, frequent turning up of fresh earth is essential to cleanliness. To do this by hand is a very difficult job, so have the yards and runs of such size and shape that a horse can be used.



Cleanliness of water dishes, food troughs and nest boxes is also important. Get the habit of cleanliness and you need not fear poultry diseases.

### INCUBATION.

The beginner can profitably follow both methods of incubation, the hen and the incubator. The production of strong, thrifty chicks depends upon other factors than the broody hen or the make of incubator used. As long as we follow the common practice of helping the chicks from the shell when they do not want to be hatched, compelling them to live by the use of flannels and soothing syrup when they wish to die, calling in the doctor whenever the growing chick or the hen has the colic, using roup and cholera and all the other "cures"; just so long will we have eggs of weak fertility and the same incubation difficulties.

*Hatching with Incubators.*—The beginner should follow closely the instructions sent with the machine he is using. It will be time enough to disregard the rules when experience has proven something else better. There are many different makes proving good in our state and we would advise buying the machine doing well in your own community. Do not hatch more chicks than you can well care for, but hatch your season's crop in as short a time as possible. To do this where many chicks are wanted will require large incubator capacity, but it will be found advisable not to prolong the hatching season unless broilers are turned off regularly. In this way the broods will be larger and fewer, the chicks will be of more uniform size, therefore more thrifty, and the poultryman will be able to devote more time to other work and thereby lessen the cost of labor.

*Hatching with Hens.*—The relative merits and advantages of natural and artificial incubation would not be altered by our discussion. Each method has advantages under certain conditions, and some poultrymen under their own peculiar conditions succeed with one method where failure results from trying the other.

Early in the season, when few hens are broody, the incubator will be found necessary to produce early chicks; later the hens will give good results if given good care.

*Where to Set.*—One of our poultrymen, for over thirty years raising poultry in Colorado, builds his nests tier upon tier along the wall of a small room. Each hen has a nest about a foot square and is fastened in. Every day at a certain time the attendant lifts out a few hens to feed, drink and exercise. When they are ready to return they are carefully lifted in and others are released for a time. To be certain that each hen is returned to her own nest she is banded with a number that corresponds with her nest number. While this means considerable work, this breeder

claims it pays as he has very little trouble with broken eggs, restless hens, etc., and has uniformly good hatches. A row of nests on the floor of an isolated room or building with the center of the floor left free and covered with loose dirt for the use of the hens, is a common and good way of caring for the setting hens. Nests should be about fourteen inches square, ten or twelve inches high, and covered so the hens cannot fight each other when on the eggs. The hen should be allowed to walk into the nest rather than jump down from a height, and loose dirt covered with a little straw or chaff should be placed in the bottom. Remove the setting hen after dark and try her with a few eggs before giving her those for hatching; fasten her in securely; in the morning lift her out to eat and drink and fasten her in until the second morning; then give her twelve to fifteen eggs and see that she has plenty of fresh water and food, preferably corn. She will probably return to her own nest now and need not be fastened in. Besides a dusting place for the hen she should be thoroughly dusted with prepared lice powder during her time on the nest, but care should be taken not to use too much powder, just a light sprinkling well into the feathers.

Hens, like incubators, should not be disturbed at time of hatching. Some hens will kill their chicks and such should be removed and the eggs given to another if possible. It will not be found profitable to help chicks out of the shell. The breeding stock should have enough vigor to produce eggs that will hatch good lively chicks on time.

*Brooders.*—The fireless brooder seems very successful and popular with our poultrymen, especially where chicks are kept in heated brooders the first two or three weeks, and are then placed in fireless brooders. This plan works very well where a comparatively small number of chicks are raised, but we would advise beginners to provide heated brooders, and only transfer the chicks to the fireless brooder when large enough to readily go in and out of their own free will, and then have the brooder in a good comfortable building. We believe there will be very little bowel trouble in the little chicks if they are never chilled, and we know the fireless brooder is responsible for many deaths among our chicks on account of chilling. When many chicks are raised a stove heating system should be installed to lessen expense and labor.

*Rearing Chicks With Hens.*—We do not like to give hens with chicks unlimited range. Certainly for a week or two after the hatch the hen should be confined to her coop or a small run attached to the coop to give the chicks time to gain strength. The chicks can be given their liberty as they will not stray far away from the mother hen. A floor or a platform of boards on which a bottomless coop is placed is necessary on account of heavy showers which are at any time possible, and which often flood the coops and drown the chicks where no floors are provided. A packing case covered with roofing paper, makes a cheap, comfortable coop. Where straw is scarce dry sifted earth makes a good covering for the

floors and should be often replaced, daily after the chicks are two or three weeks old. When two hens hatch at the same time all the chicks can be given to one hen and the other hen can be re-set if she is in good condition. We have found that hens confined to coops give their chicks more brooding, are soon contented with their narrow quarters, and will raise more chicks than when given full liberty.

### MARKETING.

Higher cost of living seems to be troubling a great many people just now, yet they are more willing than ever to pay an extra price for quality. Produce a good egg, market only eggs of uniform color and size, send clean eggs in clean, attractive carriers, and get them to the market during the summer at least twice a week.

*Marketing Chicks.*—Be careful in preparing your chicks and fowls\* for market. Have them uniform in size and color, the broilers one and a half to two pounds, and the roasters four to five pounds in weight. It pays to give both old and young stock a little special preparation before shipping. Keep in close quarters without exercise for a week before selling, feeding mashies of fattening foods. In supplying a family trade with dressed poultry, it will undoubtedly pay to crate and fatten for a better finish and appearance of the carcass as the extra quality means a better price. The Denver market prefers the yellow skinned fowls, alive.

### RECORDS AND ACCOUNTS.

Daily laying records should be carefully kept and if the hens are not doing their duty, the cause should be found and the remedy applied. Perhaps the feeding method can be bettered, or more likely the drones have not all been discovered. Incubation records which will show the fertility of different flocks or pens will help to greater success. Breeding, mortality and feeding records will be found very instructive and helpful to better results.

Poultry raising means dollars and cents, debit and credit, and every poultryman should know his exact financial position at any time. By means of carefully kept accounts of receipts and expenditures, he will be able to know what branch of his business is most profitable or is not paying; where leaks and wastes occur, what branch of his business can be profitably enlarged, and which might better be curtailed.

### POULTRY LITERATURE.

Too much value cannot be placed upon good poultry literature, and there is much to be obtained. However, one must be able to read between the lines of much that we find in our poultry journals, as the writers often have an "ax to grind", eggs to sell from the hen that laid 333 eggs in a year, a system or a method.

### POULTRY SECRETS.

There are no mysterious poultry secrets which you need to buy in order to succeed in the work. All the so-called "secrets" and "processes" can be procured through experiment stations and government bulletins. It is not the breed, nor the feed, nor the house, nor the care; not any one or two of these factors, but all carefully applied that are necessary to success.

### SELECTION AND CULLING.

Continued selection of the best, elimination of the weaklings, eternal cleanliness, comfortable shelter, plenty of fresh air, sunshine and exercise, a variety of good nourishing, succulent foods; all thoroughly mixed with love for the work and faith in the hen, seasoned with common sense and business ability; these are the great secrets of success with poultry.

### POULTRY BUILDINGS.

We might revive one of Solomon's very wise sayings and make it read: "Of the making of poultry houses there is no end," and perhaps add, "There is nothing new under the sun." Old ideas of poultry house construction are about as regularly revived as styles in hats, answer the demand of a certain class of poultrymen and are condemned by others. Limited space forbids our going into detailed instructions for building. We are giving the matter much thought and attention at the present time, and are trying out five distinct types that have been adopted by successful poultrymen, which are considered about right, and intend to build some other models for comparison. All are good, each has some advantages and some disadvantages. Location, conditions, circumstances, amount of land, price of materials, many factors must necessarily govern the type and size of the buildings.

*Reasons for Housing.*—The object of the house is to provide shelter for the fowls, and should be wind and rain proof, a single thickness of drop-siding or sheathing with building paper, being sufficient in our climate. Where lumber is used the best is cheapest, and we prefer the four-inch drop siding. Good sheathing, covered or battened will cost as much or more than drop siding, and will never make as tight a wall. Shiplap is not satisfactory as it soon dries out and leaves a crack. Whatever the materials used, have them good. If you must economize do it in the size of the building rather than in the quality of the material. Have your buildings face south, one third or one half of the south end covered with burlap or muslin curtain to be raised whenever the weather will permit, which will be nearly every day in the year. Some glass in the front may be convenient but is not necessary. The burlap curtain will furnish plenty of fresh air when closed, providing all the necessary ventilation. The door should be either in the east

or south, the west and north walls and roof being absolutely tight. We know of quite a number of poultry houses in Colorado facing east or west, but know of no good reason for it, and many against it. You will find no stronger ally in fighting disease and discomfort in your flocks than the sunshine, and the south front, especially in the long house, permits the greatest amount of it. Let it flood the coops and buildings as much as possible.

*Comfort and Convenience.*—A hen would probably consider a house about three feet high ideal, especially in cold weather, but for the convenience of the caretaker we must build them higher; unnecessary height means a colder and more expensive house, so build as low as possible, consistent with convenience. The farther the roosts are from the open end the better for the fowls—twelve feet is better than less. Make the pen shorter rather than narrower, if you want a certain floor space.

*Nests.*—Nests placed on the ground outside and against the building, covered with a slanting board to shed the rain, are sometimes very satisfactory. If within the building, they should be above the floor and boxes about fourteen inches square will be found to answer the purpose. They are preferable to expensive lumber nests as they can be destroyed when mites get into them. When trap nests are used, one nest should be provided for each two or three hens, otherwise half the number of nests will be sufficient.

*Cost of Building.*—It is easy to be extravagant in building. Don't do it. Extravagance and waste are the cause of as many failures as inexperience. Limit the cost of providing house room to sixty dollars for material per hundred hens. It can be done for less, perhaps, but ought not to cost more. A poultryman should be able to do his own building, even if he hires it done. By knowing how, it will be done right and to hire a carpenter for every little job is expensive.

*Fixtures.*—Have all fixtures such as grit boxes, feed hoppers, water dishes, etc., off the floor. We build our hoppers for grit, charcoal, oyster shell and ground grain, between the 2x4 studding and prefer them to anything we can buy. Have them two feet above the floor so no litter or dirt can get into them. In permanent houses have a platform two feet above the ground across the entire rear of the pens, above which the roosts are placed. This platform catches all the droppings, means less labor in cleaning, and means a clean floor for the hens in bad weather. The water dish can be placed on the edge of this platform.

*Roosts.*—I see many 2x4 scantlings used for roosts; a 2x2 is better and costs half as much. A round pole is objectionable as it soon splits and the cracks offer a lodging place for mites. Instead of hinging them to the wall, try driving a nail through the 1x2 used to support the roosts, to the upright studding. Your roosts can then be swung up out of the way when cleaning. Have the roosts about ten inches above the platform, and after cleaning, dash a shovel of litter or dirt over the platform which will prevent the droppings sticking and make cleaning easier.

### *DISEASES.*

The Veterinary Department of our College, under the direction of Doctors Glover and Kaupp, is working on poultry diseases at the present time. When their investigations are completed, a bulletin will be published which will be sent to all who send a request for one. Later we expect to publish separate bulletins on buildings, feeding, incubation, etc., to give the results of our experimentations along these lines. In the meantime we will gladly answer any specific questions as far as possible.

## RECENT BULLETINS.

The following recent bulletins of the Experiment Station are still available and will be sent, while the supply lasts, to anyone sending his name and address to the experiment station, giving the name or number of the bulletins he especially desires.

No.

43. Colorado Lepidoptera. A Few Species of *Deltocephalus* and *Athysanella* from Colorado. A list of Original Types etc. in Colorado.
83. Irrigation Waters and Their Effects.
84. An Apricot Blight.
97. Feeding Steers on Sugar Beet Pulp, Alfalfa Hay and Farm Grains.
100. The Flora of Colorado.
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