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The Management of Small Poultry Flocks In Hawaii

By

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THE MANAGEMENT OF SMALL POULTRY FLOCKS IN HAWAII

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INTRODUCTION

There are individuals in nearly every community who have cherished the thought of retiring to the little country home where they could fulfill a life-long ambition to raise chickens. Few of these people have the opportunity to make this dream come true, so they do the next best thing by starting a back-yard poultry flock either as a hobby or for the production of eggs and meat for the family. Because many pitfalls await amateur poultrymen, this bulletin has been prepared with the object of aiding those who plan to keep a small flock of chickens. It should help those who already have good back-yard flocks to become more efficient in their methods of management. It may also teach each beginner the fundamental principles of poultry raising, thereby making him a better poultryman.

THE OBJECTIVES OF A SMALL FLOCK

A small flock of chickens may be kept for the production of eggs and meat or primarily as a hobby for the breeding of fancy birds for exhibition. A good back-yard flock may easily combine both purposes.

Back-yard poultry raising, besides furnishing fresh eggs and an occasional chicken dinner for the family, also offers a means of utilizing table scraps which are usually wasted.

SELECTING THE BREED

The selection of a breed to start a back-yard flock depends on the preference of the individual and his purpose. For the back-yard flock owner in Hawaii who desires both eggs and meat, one of the general-purpose breeds, such as the Plymouth Rock, Rhode Island Red, Wyandotte, Australorp, and New Hampshire, would be satisfactory. If his interest is mainly in the production of table eggs, the amateur poultryman should select such breeds as the Leghorns or Minorcas. If a small flock of chickens is desired

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for exhibition purposes, some ornamental breed, such as the Bantams, Hamburgs, or the Duckwing Game, is satisfactory. In starting his little poultry venture, the beginner should make sure that the whole flock is purebred. Purebred birds are more interesting to work with than mongrels, for the purebred are more uniform in appearance, type, and color markings.

Several of the most popular breeds and varieties of chickens in Hawaii are shown in Figure 1.

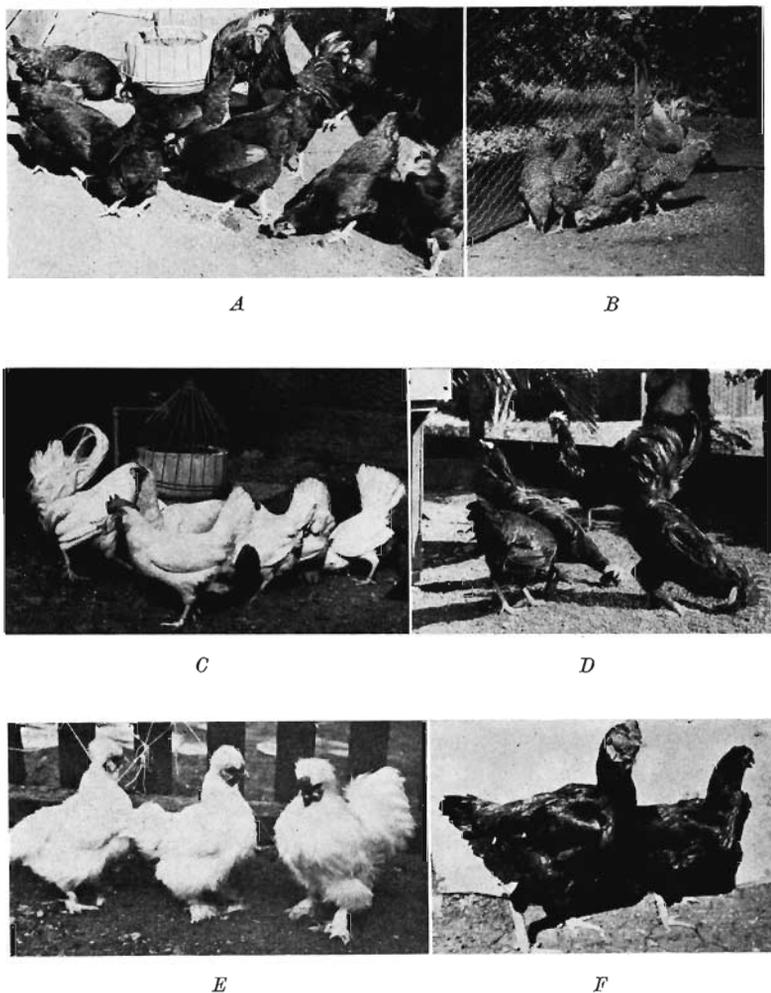


Fig. 1. (A) Rhode Island Reds, (B) Barred Plymouth Rocks—popular “dual-purpose” breeds. (C) Single Comb White Leghorns, (D) Black Minorcas—most popular egg breeds. (E) Silkie Bantams, and (F) Japanese Game Bantams—popular fancier breeds.

MAKING A START IN BACK-YARD POULTRY KEEPING

A beginner can make a start by any of the following methods:

1. Natural incubation and brooding (with sitting hens).
2. Artificial incubation and brooding (with incubator and brooder).
3. Purchasing day-old chicks.
4. Purchasing well-developed pullets (8 to 10 weeks old).
5. Purchasing laying hens.

In most cases the last two methods are preferred, for the hazards of natural incubation and brooding and the inconvenience of hatching and raising chicks artificially are often too great for the average back-yard poultryman. Pullets and young laying hens can be purchased any time from May to September. Hatching eggs or baby chicks should be ordered early (from January through April) because chicks hatched late seldom do as well as those hatched earlier. No matter what method the beginner plans to use, it is essential that he deal with a reliable poultryman who has stock of known quality and breeding. The success of a back-yard poultryman is largely determined by the quality of the stock with which he starts.

SIZE OF THE BACK-YARD FLOCK

The number of birds to keep is often a problem for the beginner. Usually from 8 to 12 hens will provide the average family with eggs throughout most of the year. If it is possible to sell a few eggs to the neighbors, then 20 or more birds can be kept. If the beginner plans to raise show or exhibition birds, he should regulate the size of his flock to conform to his equipment and the time and care he wishes to give it. One should never keep more birds than his facilities can conveniently accommodate. Many back-yard flocks have failed because of overcrowding in the poultry house and too close confinement to a limited area.

SELECTING THE BREEDERS

If the back-yard poultryman expects to be successful in raising his own birds, he must select only healthy, well developed, and vigorous breeding stock. Weak chicks are usually the result of weak parents. Mature hens, free from serious deformities, are usually better for breeding than pullets. No male should be selected unless he has vigor, masculinity, and size, and is fully matured. If possible, pedigreed males of known ancestry should be used.

NUMBER OF HENS TO A ROOSTER

For the egg-producing breeds, such as the Leghorns or Minorcas, one male to each 12 or 15 females is sufficient, and for the dual-purpose breeds, such as the Rhode Island Red or Ply-

mouth Rock, one male is required for each 8 or 12 females. Matings in the above proportions should, under ordinary conditions, give very good fertility.

THE SELECTION AND CARE OF HATCHING EGGS

The eggs selected for hatching should be clean, strong shelled, and of desirable shape and should weigh from 24 to 26 ounces a dozen. They should be gathered several times daily, especially in hot weather, and held in a well-ventilated room that is free

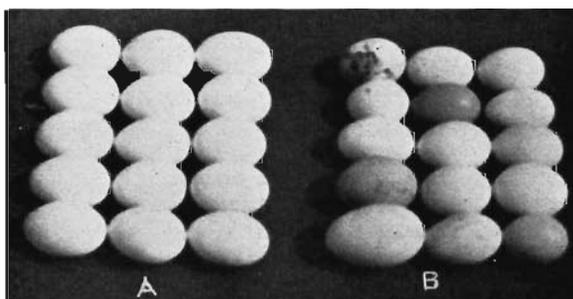


Fig. 2. Two settings of hatching eggs. (A) shows a good setting, all eggs are clean, uniform in shape, size and color. (B) shows a poor setting of eggs, irregular in shape, size, color and dirty.

from such strong odors as oil and gas, at a temperature of between 55 and 65 degrees Fahrenheit. Because they deteriorate rapidly after 10 days, hatching eggs should be placed under the hen or in the incubator as soon as possible. If they are stored longer than 3 days, the eggs should be turned several times daily to prevent the yolk from sticking to the shells.

INCUBATION AND BROODING

An individual starting a back-yard poultry flock can buy baby chicks from many local poultry breeders and hatcherymen, or he can hatch eggs at home with a hen or incubator.

The beginner will find that natural incubation has certain advantages, for this method will enable him to learn a great deal about the principles of hatching and brooding baby chicks, without having a large investment in incubating and brooding equipment. However, because of parasite and disease problems, raising chicks with hens often gives disastrous results. By purchasing good baby chicks and brooding them in cheap and efficient brooders (see Fig. 7), the poultryman can simplify the management of his flock and secure better results.

NATURAL INCUBATION AND BROODING

Selecting the Hens. Hens of the general-purpose breeds, such as the Plymouth Rocks, Rhode Island Reds, or Wyandottes, make the best sitters and mothers. They should be medium-sized hens

of good disposition. The egg breeds, such as the Leghorns or Minorcas, should never be used for this purpose, because they have a tendency to sit for several days and then leave the nest. The Asiatic breeds, such as the Cochins or Brahmas, are too large for sitters and frequently break the eggs.

Constructing the Nest. Nests for sitting hens should be roomy and comfortable, rat and mongoose proof, and located in a cool, protected place away from the laying flock. When the nests are in the poultry house or above ground, a piece of grass sod or damp earth should be placed in the bottom of the nest to provide the moisture necessary for successful hatching. Figure 3 shows a drawing of a bank of three nests for sitting hens.

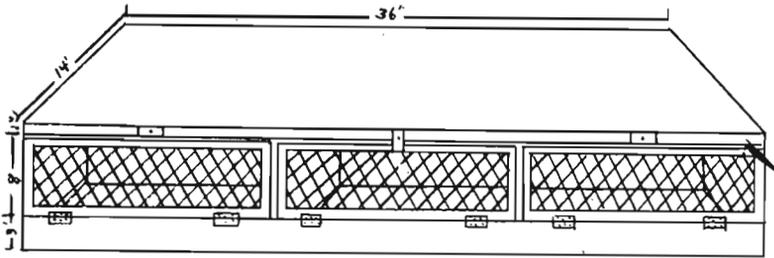


Fig. 3. A bank of nests for sitting hens. More than three to a bank may be made if desired.

Good nests can be made from egg or orange cases. A strip of $\frac{1}{2}$ inch by 3 inch batten nailed along the lower edge of the case will keep the straw in place and will prevent the eggs from rolling out of the nest. The nest should be prepared by hollowing the sod slightly, placing several pieces of newspaper on the bottom. A rounded padding of straw should be placed on the newspaper.



Fig. 4. Treating a bird for lice with sodium fluoride or flowers of sulphur by the "pinch method."

Setting the Hens. The broody hens should be transferred to the prepared nests after nightfall, and allowed to sit on infertile or artificial eggs for several days. If they remain on the nests at the end of this probationary period, the birds should be dusted with sodium fluoride to kill all lice. Then from 12 to 15 eggs should be placed under each hen. The poultryman should examine the birds for lice and mites. If he finds lice or mites on a bird, he should powder the hen again and clean the nest thoroughly.

house, until they are old enough to be transferred to the permanent laying house. The males should be fed a good ration, and, as soon as they reach the broiler stage, they should be eaten or sold.

ARTIFICIAL INCUBATION AND BROODING

Types of Incubators. There are many makes and sizes of incubators on the market suitable for the back-yard poultryman who wishes to incubate eggs artificially. It is usually advisable to follow the manufacturer's directions which accompany each machine. It is, however, well to use judgment in the operation of

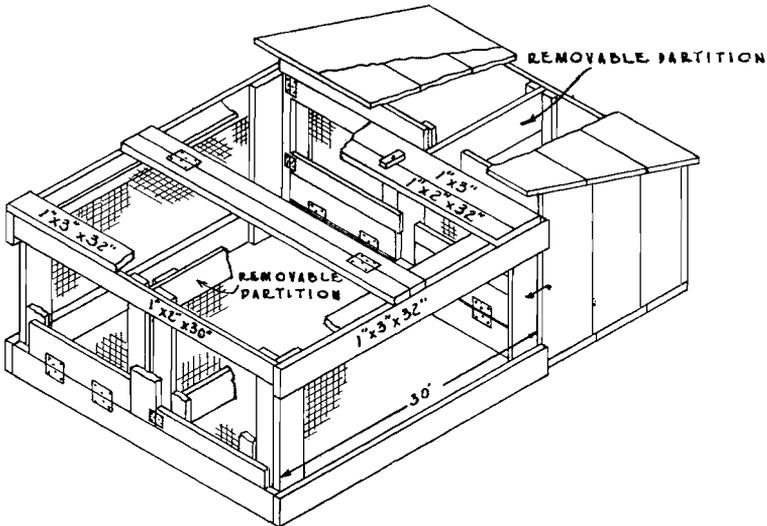


Fig. 6. A portable brood coop for natural incubation and brooding. Two hen capacity. (Courtesy Kansas Agricultural Experiment Station.)

a small incubator in Hawaii, for all incubators are made on the mainland for mainland conditions and do not always work according to directions here. Usually the small machines do not provide sufficient ventilation for local conditions. This defect can be remedied by enlarging all openings so that the moisture-laden air is allowed to escape from the egg chamber. Success in artificial incubation depends upon certain fundamental principles of management, of which the following are some of the most important:

1. The incubator should be placed in a well-ventilated room that is free from drafts.
2. It should be level.
3. It should be run at temperatures recommended by the manufacturer until they are proved to be wrong.

4. The eggs should be turned 4 to 6 times daily for the first 18 days of incubation.

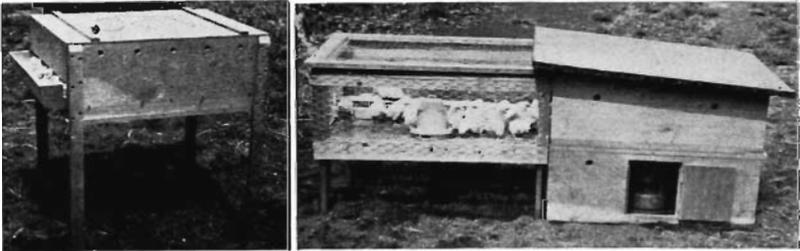
5. The poultrymen should test for infertile eggs on the seventh or fourteenth day.

6. The incubator should not be disturbed from the eighteenth day until the hatch is completed.

7. The incubator should be thoroughly disinfected between hatches to control disease, especially Pullorum (Bacillary White Diarrhea).

The average back-yard poultryman may expect from 50 to 75 strong vigorous chicks from each 100 eggs set in the incubator. This figure, naturally, depends a great deal upon the quality of the stock from which the eggs came and the management and ability of the operator.

Artificial Brooding. The brooding of chicks artificially by back-yard poultrymen in Hawaii has proved to be successful and practical. Artificial brooding decreases the drudgery and gives results superior to those obtained by brooding with hens. Figure 7 shows two small brooders—the electric light brooder, and the lamp brooder—both of which have given back-yard poultrymen throughout the territory excellent results.



A

B

Fig. 7. Electric light brooder (A). Lamp brooder (B). (A courtesy Henry Gouveia.) (B courtesy Louisiana Agricultural Extension Service.)

The electric light brooder derives its name from the fact that the heat is supplied by a 60 watt light bulb. It is large enough to accommodate from 25 to 35 chicks for 3 or 4 weeks. This brooder has a wire floor of $\frac{1}{2}$ inch mesh hardware cloth, which allows the droppings to fall through to a metal pan below. This enhances sanitation and helps in the control of diseases. The chicks eat and drink at troughs or containers fastened to the outside. The light bulb used for heat should be either the regular red globe or a globe painted red. This will subdue the light and help in the control of cannibalism. The electric light brooder can be kept on the porch or hallway of any home, for it is clean and odorless.

The lamp brooder is a simple, practical, and economical brooder, large enough to accommodate from 75 to 100 chicks for

3 or 4 weeks. This brooder also has a removable wire floor of $\frac{1}{2}$ inch mesh hardware cloth as well as a wire-floored sun porch. The source of heat is from a kerosene incubator lamp, a lantern or a low-type house lamp, which heats the sand-covered tin bottom of the brooder.

The object of the sand is to absorb the heat and distribute it evenly throughout the brooder, and for the collection of the droppings. When the lamp is placed under the brooder, a 1-inch space should be allowed between the brooder floor and the top of the chimney. The lamp should be started from 24 to 36 hours before the chicks are placed in the brooder, in order to dry the sand, so that an even temperature can be provided for the chicks.

Two 18-inch self-feeders, constructed so that the chicks can eat from both sides, and two 1-quart water jars are necessary for the brooder. This brooder is mosquito-proof and can be placed outside in any kind of weather.

PRINCIPLES OF BROODING CHICKS

Successful management of baby chicks in brooders requires attention to the following fundamentals:

Start with good chicks which are free from disease and are descended from healthy parent stock.

Temperature must be maintained at the proper level. A temperature of 95° F. is recommended for the first week, with a reduction in temperature of 5° F. each week until no heat is required. After the first few days, the temperature may be regulated according to the action of the chicks. Heavy breathing or panting of chicks indicates an overheated condition; whereas crowding or bunching together in a corner or around the source of heat indicates the need of more heat.

Ventilation. A constant supply of pure fresh air is necessary for proper brooding. Both the brooders mentioned above are so constructed that there is a free interchange of air.

Sanitation. The success of the brooding enterprise will depend a great deal on proper sanitation. By starting with big, strong, clean, vigorous chicks from healthy parents, which are placed in a clean brooder with plenty of clean feed and water, the poultryman will find his battle more than half won. All water and feed vessels should be cleaned and disinfected daily. The brooders or brood coops should also be cleaned and disinfected at regular intervals with a commercial or home-made spray. A very good spray can be made by mixing 1 part of crude oil and 3 parts of kerosene oil. This spray is penetrating and kills mites.

Feeding Chicks. Baby chicks may be fed immediately after they are placed in the brooder. In order to teach them how to eat, the poultryman should place on the floor of the brooder a piece of paper or an egg-case cup flat, upon which are small amounts of starting mash and chick size grit. The drinking water may or may not be warmed for the first few days. After the first day,

the mash should be placed in small chick hoppers and the water in convenient fountain type jars. (See Fig. 8.)

Sufficient hopper space should be provided so that all or a majority of the chicks can eat at the same time. This is very important during the first few weeks, for the growth of the chicks may be uneven if some do not get sufficient food. About 100 percent of the chicken feed used in Hawaii is a commercial product; therefore, local poultrymen do not have to worry about their chickens receiving a balanced diet. It is a good practice to follow the instructions of the feed manufacturer. With good chicks from good stock, and with proper care and management, mortality should be kept down to a minimum. The chicks should weigh from $1\frac{1}{4}$ to 2 pounds at 8 weeks of age.

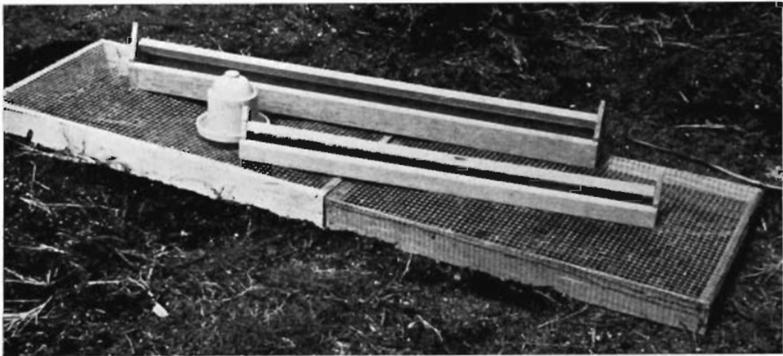


Fig. 8. Mash hoppers for different size chicks. Sanitary water jar and wire-floored platforms.

Baby Chick Troubles. Anyone raising baby chicks should watch for diseases and vices. No matter how careful an individual may be, chick troubles start quickly and cause great losses in a short time. The following convenient chart gives information concerning several of the most important troubles that a backyard poultryman in Hawaii is most likely to encounter.

Management of the Growing Stock. The brooding period for chicks lasts until they require no artificial heat. In Hawaii this period may vary from 4 to 6 weeks or longer, depending a great deal upon weather conditions. The young stock should then be large enough to transfer to one of the wire-floored houses where the pullets can develop to maturity.

Removing the Males. As soon as the chicks are old enough to distinguish the sex, the cockerels and pullets should be separated. It is possible to do this in from 4 to 8 weeks, depending upon the breed. This is very important, for the males usually develop faster sexually and soon become a source of annoyance to the pullets. They are also larger and stronger and crowd the pullets away from the feed hoppers. The males may be kept segregated and, at a later date, sold or eaten as broilers, or they may be caponized and kept for meat.

CHICK TROUBLES	SYMPTOMS	TREATMENT OR PREVENTION
Pullorum (Bacillary white Diarrhea)	Sleepy, sluggish. May be some diarrhea. Unkempt appearance. High mortality during first 5 days.	Pullorum disease can best be controlled by prevention. This is done by testing all breeders for Bacillary White Diarrhea. Remove all reactors from the flock and hatch from only the non-reactors. If you purchase baby chicks or hatching eggs, be sure that they are from a tested flock.
Coccidiosis	Sleepy, sluggish. Lose appetite. Diarrhea may or may not be bloody. Mortality is usually high.	Clean houses every two days. Feed 40 percent buttermilk mash. Burn all chicks that die and all litter removed from house. Coccidiosis can be prevented by raising chicks on wire floors.
Colds	Chicks appear sleepy. Fail to eat much. Mash and litter stick to beak. Gas p for breath.	Check for faulty ventilation, damp floor. Give Epsom salts, 1 teaspoonful in a quart of warm water. Leave before birds 3 hours. Put an anti-septic in drinking water. Clean house. Add 4 ounces of biologically tested cod-liver oil to 25 pounds of feed and mix thoroughly.
Chilling or Overheating	Both have about same symptoms. Diarrhea may or may not be present. Chicks get weak and thin, fail to eat as they should.	Keep house clean. Do not chill or overheat others. Regulate temperature.
Chicken Pox	Warty nodules on head and comb and wet, running eyes and inflamed eye membranes.	May be treated by scraping off all scabs and painting the raw surfaces with a tincture of iodine. This disease can be successfully prevented by vaccination. This can be done with stock from 2 to 6 weeks of age or older. Be sure that chicks are free from coccidiosis when vaccinated, otherwise the results may be disastrous.
Cannibalism and Tail or Toe Picking	Tail and wing feathers picked until parts are bleeding. Toes picked and bleeding.	Paint all picked chicks with a medicinal grease and put back in pen. Clip upper beak of chicks. Subdue the light in brooder house.

Feed and Care of Pullets. While moving the pullets to the wire-floored house, all weak and poorly developed individuals should be culled. The others should be fed a balanced ration of mash and grain throughout the growing period. The amount of scratch grain should be reduced gradually until the amount to feed is dependent upon the condition of the layers. If the feeding of scratch is light, the pullets will eat larger amounts of mash, with the result that they may come into production before having attained maximum body development. This is undesirable for such a pullet cannot stand the strain of heavy egg production, and will die or become a cull. Pullets of the egg breeds should come into production about 5 or 5½ months of age and those of the dual-purpose breeds about 5½ or 6 months. Pullets should always be well fleshed and developed as they approach the laying stage.

Growing pullets need plenty of clean, fresh water, grit, shell, and charcoal and small amounts of green feed. Feed and minerals should be kept in hoppers so that the birds have access to them at all times.

FEEDING LAYING HENS

Laying hens require plenty of feed. The average light breeds, such as the Leghorn, eat approximately from 75 to 85 pounds of feed a year, and the heavy breeds, such as the Plymouth Rock or Rhode Island Red, consume approximately from 85 to 95 pounds during the same period.

Practically all poultry feeds used in Hawaii are commercial products. Therefore, the feeding problem of our local poultrymen is not nearly so important as it is to the individual who mixes his own feeds. The back-yard poultryman has the choice of three different feeding systems: the all-mash system, the mash-grain system, and the pellet system. The last is a fairly recent development in poultry feeds, in which the mash is compressed into pellets. All these systems are good, and the choice will depend upon the individual's preference. It is suggested that the feed manufacturer's instructions be followed. If a change of feed is desired, the change should be made gradually so that the laying flock will not be affected by it.

The following points are worth remembering in the feeding of laying hens:

1. Ample hopper space (about 5 feet of hopper space is sufficient for 25 birds) should be provided.
2. Plenty of cool, clean water should be accessible at all times.
3. The hens should have access to dry mash at all times.
4. An ample supply of minerals, such as oyster shell, grit, and charcoal, should be in the hoppers at all times.
5. A moist mash may be fed to the flock at noon (about 1 pound to 25 birds). This practice helps to stimulate the birds' appetites and prevents heavy layers from losing weight.
6. Scratch grain should be fed in the hoppers twice daily, in amounts limited to what the birds can consume in 15 or 20 min-

utes. This practice also helps to maintain normal body weight of heavy layers.

SUPPLEMENTAL FEEDS

Table Scraps. Because of the fact that many back-yard flocks in Hawaii are kept primarily for the utilization of table and kitchen scraps, it is necessary to plan on using this food with the regular ration. This can be easily done by mixing it with laying mash and feeding the mixture as a moist mash at noon.

Green Feed. Small amounts of green feeds daily are very desirable for the back-yard flock. This can be supplied by lettuce, cabbage, lawn clippings, ekoa, pigeon pea leaves, and sweet potato vines.

Avocados, Bananas, and Sweet Potatoes. All of these local products make excellent supplemental feeds for laying hens.

ADULT POULTRY TROUBLES AND PARASITES

Sanitation is the keynote in maintaining the health of the flock. The poultryman who ignores this important phase of management is bound to pay for his negligence. Diseases and parasites of adult birds always constitute a menace to their health and well-being. The following convenient chart gives information on the most common troubles of adult poultry in Hawaii.

Adult Poultry Troubles and Parasites	Symptoms	Treatment and Prevention
Range Paralysis or Blindness	Lameness in legs or wings. Grey or white eyes, irregular pupil. Common in chickens from 3 to 18 months or older.	No known treatment. Best prevention is to breed up the resistance of the flock. Use only old hens with good eyes (reddish-bay colored) that have completed at least 1 year of lay and old cock birds with good eyes as breeders.
Coccidiosis	Refer to baby chick troubles.	
Fowl Pox—Sorehead	Refer to baby chick troubles.	
Roup and Colds	Thin, yellowish discharge from nostrils. Becomes sticky and thick, with bad odor. Bulging about head and eyes. Loss of appetite, hard breathing.	Give Epsom salts at rate of $\frac{1}{4}$ pound to 25 hens in wet mash. Follow with individual treatment with 15 percent Argyrol solution placed in eyes, nostrils, and throat for several days. In combating disease, sanitation is imperative. Clean and disinfect house, feed and water vessels. Place antiseptic in water, check for faulty ventilation, avoid overcrowding. Slightly moisten small amounts of scratch grain with cod-liver oil and hopper feed morning and afternoon.
Bumble Foot	Bruise or cut on bottom of foot. Lameness.	Lance bruise, squeeze out pus core. Wash wound in creoline solution. Apply iodine and bandage. Can be prevented by lowering roosts, removing rocks and broken glass from yard, and using 1" x 2" mesh wire for floors.
Cannibalism or Feather Picking	Vents, tail, and wing feathers picked and bleeding.	Where "pickouts" occur, no treatment is satisfactory unless bird is caught in time. Paint affected parts with medicinal grease and remove from flock until well. Several devices on market are very effective in preventing this vice. Clipping upper beak is fairly effective for several weeks.
Tapeworms	Form of paralysis, thin, emaciated, ruffled feathers, unthrifty appearance, diarrhea.	All drugs give only temporary relief. Prevention is accomplished by frequent removal of droppings to avoid heavy fly infestation. Confine birds to wire-floored houses.
Common Round Worms	Thin, weak, emaciated, ruffled feathers, diarrhea.	There are several good commercial products on market for expelling worms. Can be largely prevented by confining birds to wire-floored houses.
Lice	Weak and emaciated, ruffled feathers. Birds always picking in feathers.	Apply sodium fluoride or flowers of sulphur using the pinch method for individual treatment. Apply Black Leaf 40 to perches 30 minutes before birds go to roost for flock treatment. Lice are killed by fumes. Repeat each treatment within 7 days.
Common Red Mites	General unthrifty appearance, weak, and emaciated.	Spray house and nests thoroughly with solution of $\frac{2}{3}$ crankcase oil and $\frac{1}{3}$ kerosene. Or paint roosts, dropping boards, cracks, and crevices with Anthracine or some other penetrating oil.

CULLING THE BACK-YARD FLOCK

Culling in its broadest sense applies not only to the process of removing low, unprofitable producers from the flock, but it enters into the selection of the hatching egg, the baby chicks, the growing pullets, and cockerels as well as the breeding stock. In other words, culling is a continuous operation throughout the year. Good culling requires a great deal of experience. It is better for the beginner to confine most of his culling to the removal of sick birds and those that are obviously culls or non-layers. This can best be done at night, with the aid of a flashlight. Birds with shriveled combs, hard leathery abdomens, or dry and contracted vents should be removed.

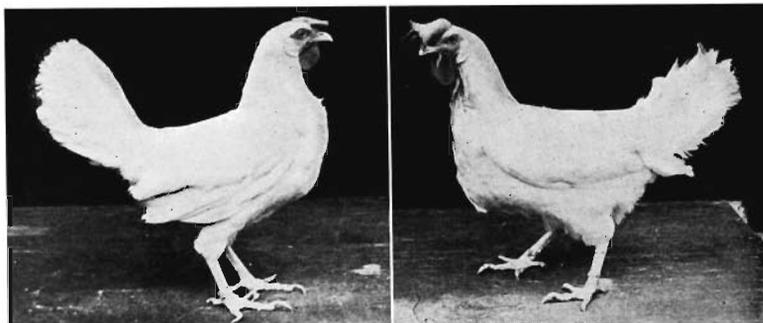


Fig. 9. Left: poor layer; right, good layer.

RAISING CAPONS

Caponizing, or the emasculation of cockerels, is not a new art. It has been practiced by the Chinese for centuries and from China it probably spread to ancient Rome and Greece. The capon industry is quite important in certain sections of the mainland. It can become equally important in Hawaii. A few capons in each backyard flock could be used to advantage for home consumption. They can be produced from the surplus cockerels.

Some of the advantages of caponizing are:

1. A larger and heavier fowl at killing time.
2. Sweeter and finer-flavored meat.
3. A quiet, even temperament, which permits several capons to be run together.
4. Capons can be used for hovering chicks.

Cockerels of any breed may be caponized, but Plymouth Rocks, Rhode Island Reds, Brahas, and Jersey Giants are considered best. The details of the caponizing operation are described in Circular No. 7 of the Hawaii Agricultural Experiment Station. Those interested may obtain a copy by writing to the Experiment Station in Honolulu.



Fig. 10. Rhode Island Red Capon.

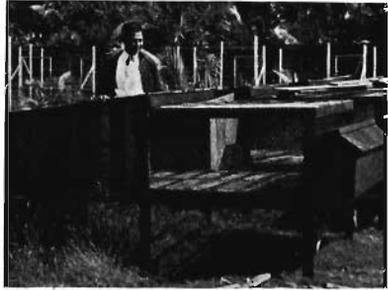
TYPES OF HOUSES FOR THE BACK-YARD FLOCK

There are several different types of houses suitable for the small flock owner of Hawaii. Figure 11 shows pictures of those which have proved to be the most popular for local conditions. These houses vary in size and design, accommodating from 7 to 30 birds. The cost of these structures will depend on the builder and the material used. All except house A are suited for either the confinement or semi-confinement system of management. House A, which was designed principally for Bantam fanciers, has solid floors, whereas the others are wire-floored.

Because of the parasite and disease problems in Hawaii, the wire-floored house, with strict confinement, is advisable for the small flock that is kept mainly for egg production. Where room is available, the flock may be allowed the use of a run. However, small yards always become extremely dirty and unsanitary. Therefore, where it is desired to run the birds on the ground, there should be a rotation of yards so that clean ground is always available. This can be done by having two yards and allowing the flock to run on one for several months, and then changing it to the other. The yard that is being rested should be spaded deeply and limed. This treatment, together with the action of the



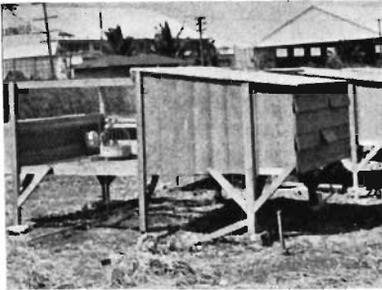
A



B



C



D



E

Fig. 11. Different types of houses for back-yard poultrymen. (*A*) a convenient, movable house with wire-inclosed run for bantams or large fowls. (*B*) small back-yard wire-floored house for ten birds. (*C*) the regular back-yard wire-floored poultry house for 25 birds. (*D*) another type of small wire-floored house large enough for 20 hens. (*E*) a popular house for birds on free range, capacity 15 birds. (*A, C, E* courtesy Hawaii Agricultural Experiment Station; *B* courtesy Kalakaua Intermediate School; *D* courtesy Flying Chick Poultry Ranch.)

sun and weather, should put it in excellent shape for the flock when the other yard is contaminated.

LOCATING THE BACK-YARD POULTRY HOUSE

Many back-yard poultrymen have little choice in the location of the poultry house, because of lack of space. Where possible, the house should face away from the direction of the prevailing wind. This precaution is important, for chickens are more likely to get colds if the wind blows directly on them from the front.

Individuals in cities and towns who are interested in raising a back-yard flock should, before building a poultry house, acquaint themselves with the Board of Health regulations. This precaution may prevent a great deal of inconvenience and expense.

POULTRY HOUSE EQUIPMENT

The roosts may be placed on the floor or 13 inches above the floor, and 12 inches apart, in any of the wire-floored houses. The roosts should be made of 2 inch by 3 inch boards with the upper surface beveled. The nests may be of the trapnest or of the open front style. The bottom of the nests may be solid or composed of $\frac{1}{2}$ inch mesh hardware cloth. The feed troughs should be separate from the house and should be held in place by braces. Both nests and feed troughs may be placed either in front or on the sides of the house. Drip-nipples should be used for supplying water. The flow of water should be controlled by a float valve. Five nipples will supply enough water space for 25 birds. This watering system is very sanitary, efficient, labor saving, and easily operated by the birds.

MANAGEMENT

These wire-floored houses may be used for birds confined or on free range. Where the birds are allowed to range on the ground, the space beneath the house should be enclosed with wire or laths. Automatic watering fountains, self-feeding hoppers, and wire floors make this type of house efficient and easy to operate. It is suitable for all sections of Hawaii.

SANITATION IN THE LAYING HOUSE

Success in the poultry enterprise depends in a large measure upon sanitation.

In cleaning a poultry house, all movable equipment, such as nests, drinking vessels, feed hoppers, and roosts, should be removed. A hot lye solution (about $\frac{1}{2}$ tin of lye dissolved in 10 gallons of hot water) should be used for softening the droppings which adhere to the floor supports. This solution should also be used to wash the walls around the sleeping quarters to a height of 3 feet. Next, the whole house may be washed with water and allowed to dry. Then it should be sprayed with a good poultry

house spray. The equipment should also be cleaned, thoroughly disinfected, and replaced. Nothing should be used to clean the nests that may impart a bad odor to the eggs. The wire-floored laying house requires a thorough cleaning and disinfecting several times a year.

Droppings should be removed from under the house at least once each week. This practice helps in preventing odors and in controlling flies.

MISCELLANEOUS INFORMATION

Care of New Stock. Many back-yard poultrymen of Hawaii import breeding stock or laying birds each year from the mainland. This is one way to introduce certain contagious diseases into the flock. When ordering birds, the poultryman should specify that they be vaccinated for fowl pox, before they are shipped from the mainland. If this cannot be arranged, then the buyer should vaccinate the birds before bringing them on his place. Many a good bird has been ruined by this disease, for few are immune to it. Before housing new stock with the other birds, the poultryman should dust them for lice, and wash their legs and beaks with a good disinfectant and their eyes and nostrils with a 15 percent solution of argyrol. They should then be held in isolation for about 14 days to see if any disease symptoms develop.

Provide Shade for the Laying Flock. Every back-yard flock that is allowed to range on the ground should be provided with shade. This is important in Hawaii during the hot, dry months. The fast growing pigeon pea and ekoa make excellent sources of shade for chickens, and they are also a good green feed.

Flock Replacements. From the viewpoint of the commercial poultryman, the most profitable birds in the flock are the pullets. Their best egg records are made during the first 12 months of lay. Production is decreased from approximately 25 to 35 percent each succeeding year. Therefore, flock replacements on the large commercial farms of Hawaii may range from 35 to 50 percent each year. Replacements for the home flock need not be so large, for many hens are excellent producers for 2 or 3 years. This is especially true in the case of hens that have established themselves as good breeders.

Keeping Records. Record keeping is often neglected by the back-yard poultrymen. Few keep any account of the business transactions. Thus they cannot determine whether or not their flocks are profitable. Any well managed business has to keep records, otherwise it would fail. Records are just as important to the beginner as to the commercial poultryman. They help an individual in determining the cause of losses and how to prevent them. Many back-yard poultrymen of today may be Hawaii's commercial poultrymen of tomorrow. Therefore, the practice that an individual gets in dealing with the small flock may prove of lasting value. The back-yard poultryman may use a cheap

notebook for keeping the necessary records, such as eggs produced, feed and supplies bought, eggs and chickens eaten or sold, mortality, and labor.

For 6 years the Economics Division of the Extension Service has kept cost of production records and all their reports are available for the use of Hawaii's poultrymen.

The following sample record page will prove of value to backyard poultrymen who wish to keep cost records of their project.

**SAMPLE RECORD FORM FOR
POULTRY MANAGEMENT PROJECT**

Month of _____, 19____

CASH INCOME FROM ALL SALES						FLOCK RECORD				
Date	Description	Market Eggs	Hatch Eggs	Poultry Stock	Misc. Income	Day	Eggs Laid	Hens Died	Hens Sold	Hens Added
		\$	\$	\$	\$	1				
						2				
						3				
						4				
						5				
						6				
						7				
						8				
						9				
	Totals	\$	\$	\$	\$	10				
Hatch Eggs Home Use Doz.		@	Total			11				
Eggs Home Use No. Doz.		@	Total			12				
Poultry Home Use No.		@	Total			13				
Total All Income		\$	\$	\$	\$	14				
Doz. Eggs Sold		Large	Medium	Small		15				
CASH EXPENSES FOR ALL ITEMS						16				
Date	Description	All Feeds	Eggs & Stock	Hired Labor	Misc.	17				
		\$	\$	\$	\$	18				
						19				
						20				
						21				
						22				
						23				
						24				
						25				
						26				
						27				
						28				
						29				
	Totals	\$	\$	\$	\$	30				
FAMILY LABOR						31				
Whom			Hours	Value		Total				
Operator				\$						
Other										
Totals				\$						

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U. S. Department of Agriculture
Cooperating
Acts of Congress of May 8 and June 30, 1914