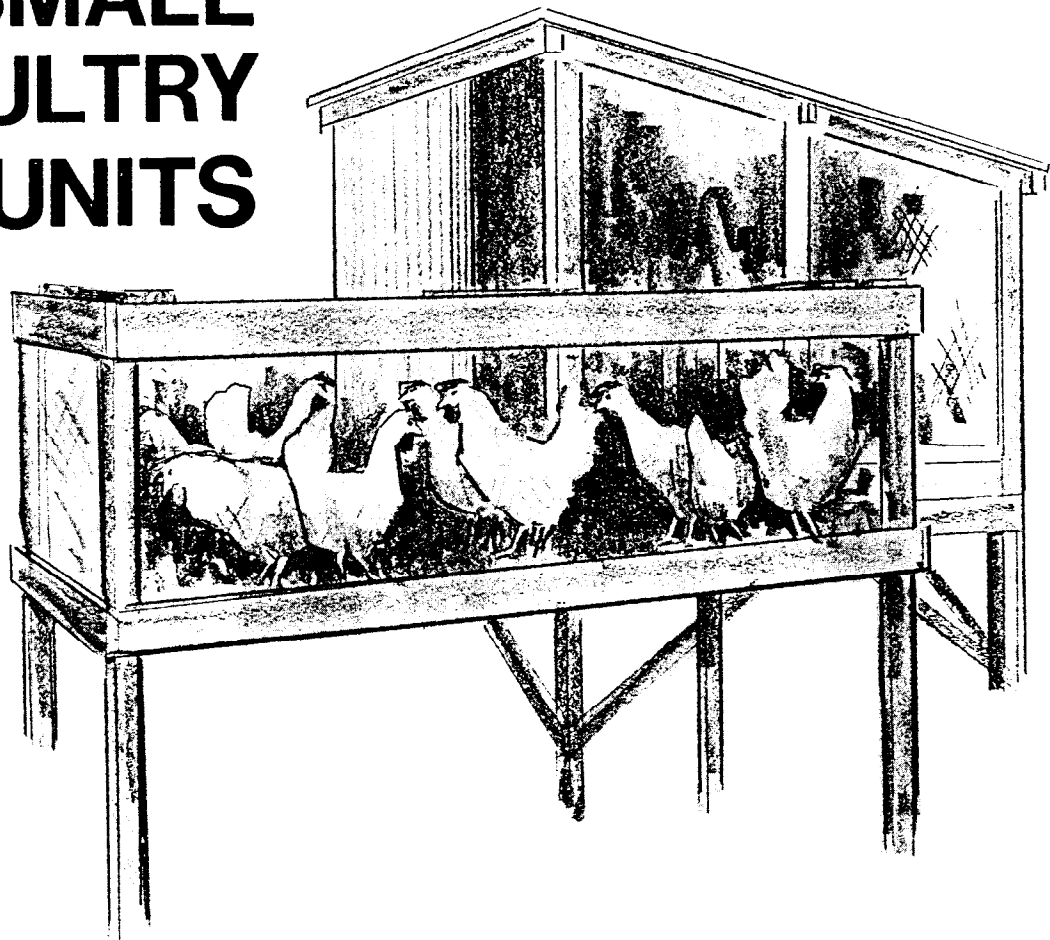


# STARTING AND MANAGING SMALL POULTRY UNITS



Division of Agricultural Sciences  
UNIVERSITY OF CALIFORNIA

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# STARTING AND MANAGING SMALL POULTRY UNITS

## INTRODUCTION

Inquiries from farmers and home owners throughout the state prompted the issue of a publication aimed at the small unit or home poultry raiser.

In helping those interested in raising poultry for fun, or to supplement the family diet, this publication gives basic answers to such questions as what is the best breed to raise; what kind of housing and equipment are needed; what is the required management; how to control diseases; and other information essential to the keeping of small flocks.

Additional information can be obtained from other publications mentioned in this text, and from your County Farm Advisors office.

## SELECTION OF STOCK

The kind of stock to select depends on your objectives in poultry keeping. Most small flocks are raised to provide a supply of fresh eggs, fun and education for the family, and perhaps an occasional chicken dinner. Some may desire a flock for production of fryers (3 to 4 pounds), or roasters (5 to 8 pounds). Small flocks are also kept for exhibition at fairs or poultry shows. Each of these projects requires a different kind of stock. For more information, refer to *Chickens for Home Use*, Leaflet 2894.

### AGE TO BUY

In starting any poultry project, day-old baby chicks are the most economical and safest

choice. They should originate from eggs laid by Pullorum-typhoid<sup>1</sup> clean stock and may be obtained from local hatcheries or other poultry supply businesses. Chicks are usually available straight-run, or sexed; females or males. Keep in mind that Leghorn-type males are a poor choice for meat production. If possible, buy stock vaccinated for Marek's disease.<sup>2</sup>

<sup>1</sup>Pullorum-typhoid—egg transmitted diseases. Can be prevented by blood testing breeding stock.

<sup>2</sup>Marek's disease—a viral disease of chickens. Causes tumor-like lesions in nerves and other internal organs; death losses may exceed 30% by 20 weeks of age.

Egg production stock may also be purchased as pullets between 6 and 22 weeks of age. Older hens, discarded by commercial egg producers, may also be available. The purchase price will vary with the age, breed, and strain of the birds, and their potential life as egg layers. Commercial hens today are often retained in the egg production flock until they are 30 months of age; at this age they are a poor choice for starting a home poultry project.

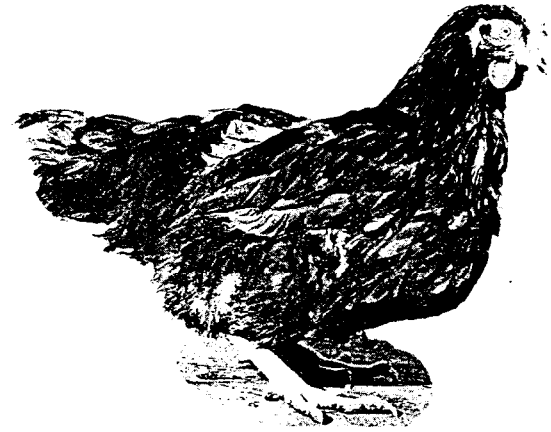
### STOCK FOR MEAT PRODUCTION

Economic poultry meat production requires stock that can make optimum use of its feed. Cross-breeds using various combinations of Cornish, Plymouth Rock, and New Hampshire blood lines are recommended. These crosses will reach 3 to 4 pounds in weight at about 8 weeks of age under optimum conditions and make excellent meaty fryers or roasters.

### STOCK FOR EGG PRODUCTION

Commercial Leghorn-type egg-laying strains are widely available and make the best egg producers. If brown eggs are desired, the heavier strain crosses used commercially are the best choice.

The males of these crosses make reasonably good fryers or roasters. Several pure breeds such as white or barred Plymouth Rocks, Rhode Island Reds, New Hampshire Reds, or Wyandottes can be used for egg or for meat production, but they generally don't lay or grow as well as crosses, and will require more feed per dozen eggs produced or per pound of weight gained.



Rhode Island Red



White Plymouth Rock



Leghorn-Type Egg-Laying Hen

## STOCK FOR EXHIBITION

Breeding and developing various strains and varieties of poultry is a vocation that has provided enjoyment to many people, and has led to the characterization and standardization of many different colors and types of poultry. Exhibition stock varies in its quality or trueness to standard type; experience in judging is necessary before one can evaluate the quality of stock for exhibition.

Information on the recognized breeds and varieties of standard size and bantam chickens is contained in the American Poultry Association publication, *The Standard of Perfection*. Bantams (smaller poultry) are also described in detail in the American Bantam Association's *Bantam Standard*. For more information, write to the American Poultry Association, Inc., Box 351,

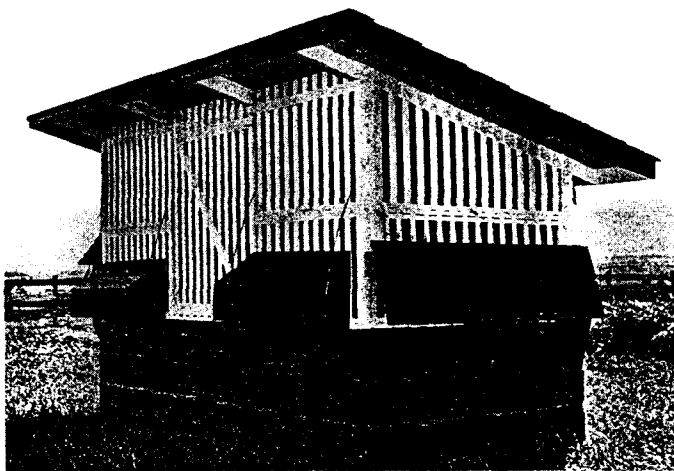
R.D. No. 4, Troy, New York 12180 or the American Bantam Association (Fred Jeffrey), P.O. Box 610 N. Amherst, Massachusetts 01059.

## BANTAMS

Bantams are a popular form of poultry. They range in weight from 1 to 2 pounds, therefore they eat less feed than larger chickens. Their management is much the same as that for other types of poultry. In enclosed pens each bird should be provided between  $1\frac{1}{2}$  and 2 square feet of floor space and between 4 and 5 inches of roost space. Smaller nests can be used for bantams but conventional nests work equally well. If nests are constructed, the smallest dimension should be at least 9 inches. Feeders and waterers of an appropriate size should be used so that the birds can eat and drink comfortably.

# HOUSING

Poultry housing should provide optimum conditions for growth and egg production, by protecting the flock from wind, rain, and temperature extremes. The chickens' house should be designed so that it is convenient for the operator to care for the birds and to clean and sanitize the pen.



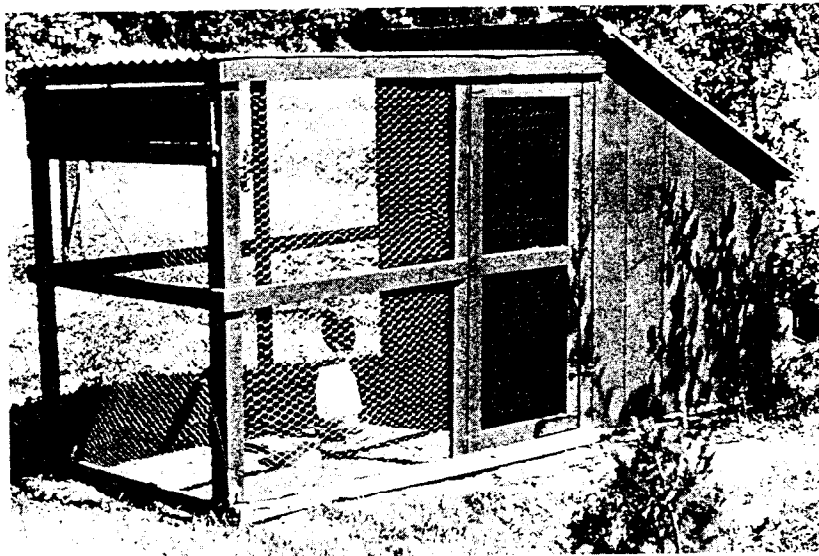
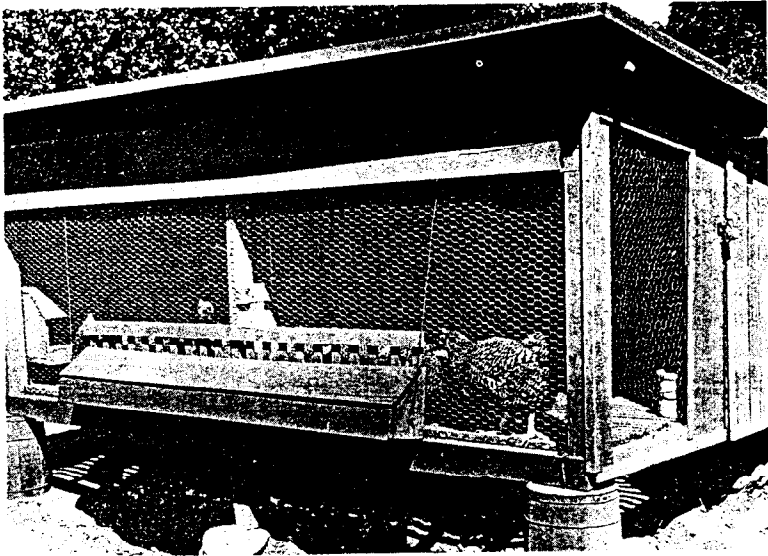
Type of Housing

Whenever possible, chickens of different ages should be housed separately. They can be placed on litter (loose housing) or in cages.

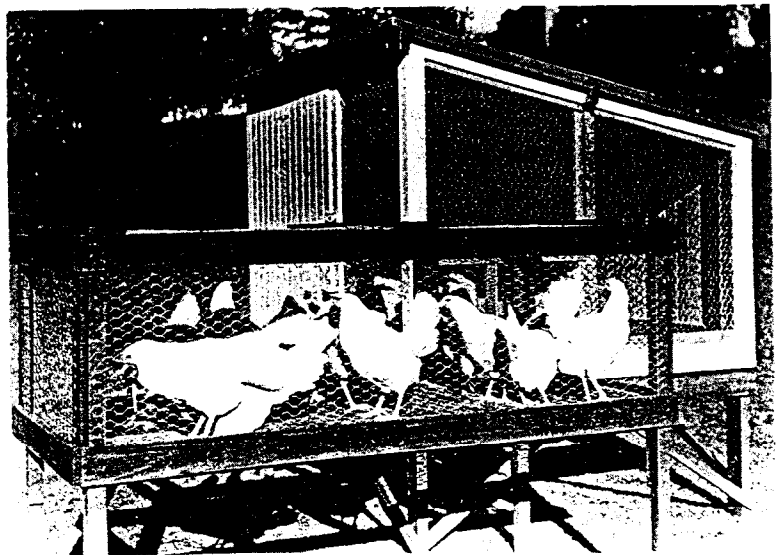
## FLOOR SPACE

Chicks up to 6 weeks of age need at least half a square foot of floor space per bird. From 6 to 12 weeks of age, 1 square foot per bird is recommended. Growing pullets from 12 to 20 weeks of age should have a minimum of  $1\frac{1}{2}$  to 2 square feet of floor space. The space required by laying hens depends largely on their size. Small breeds and bantams require 2 to  $2\frac{1}{2}$  square feet per bird, while larger breeds need 3 to  $3\frac{1}{2}$  square feet.

Range pens or outdoor runs may be used to provide extra space but the house should still be big enough to accommodate all birds at night and during storms or other extreme weather.



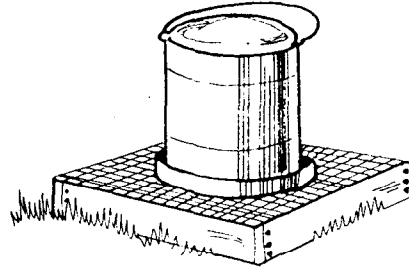
Different Types of Housing



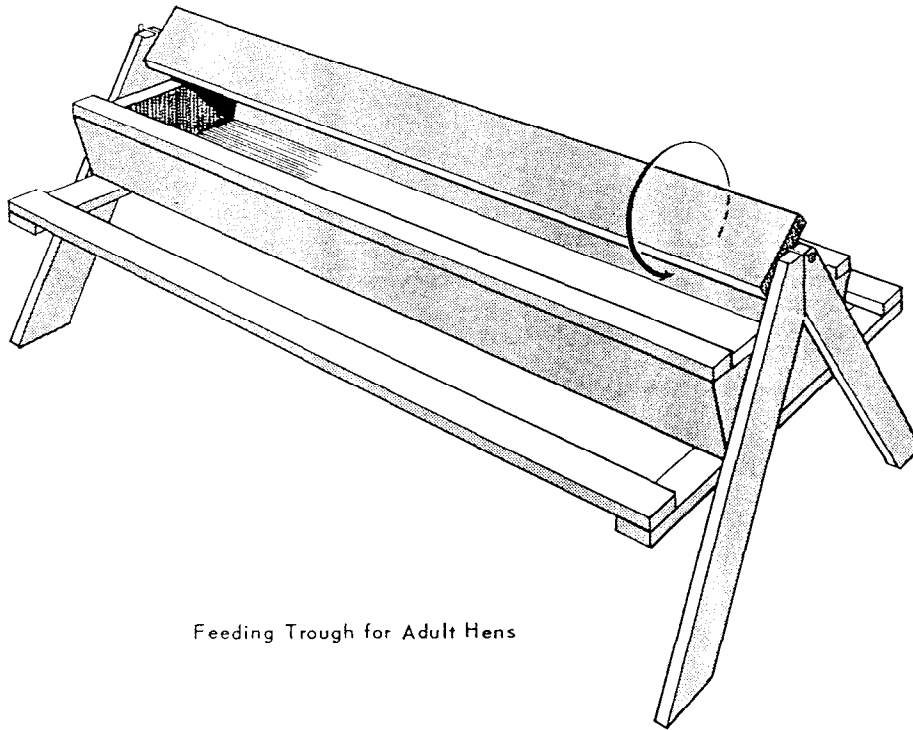
## EQUIPMENT

Feeding and watering equipment can be purchased from local feed outlets or from mail order houses. Simple feed troughs can be home-built if desired. To minimize feed wastage, troughs should be made so that the height can be adjusted as the bird grows. It is desirable to place a platform under water fountains to avoid wet litter. Wet litter contributes to disease problems.

If a pressurized water system is available, one may consider buying an automatic water fountain of some type. The cost is reasonable, labor is saved, and a constant supply of fresh water is available for the poultry.



Water Fountain on Wire Platform



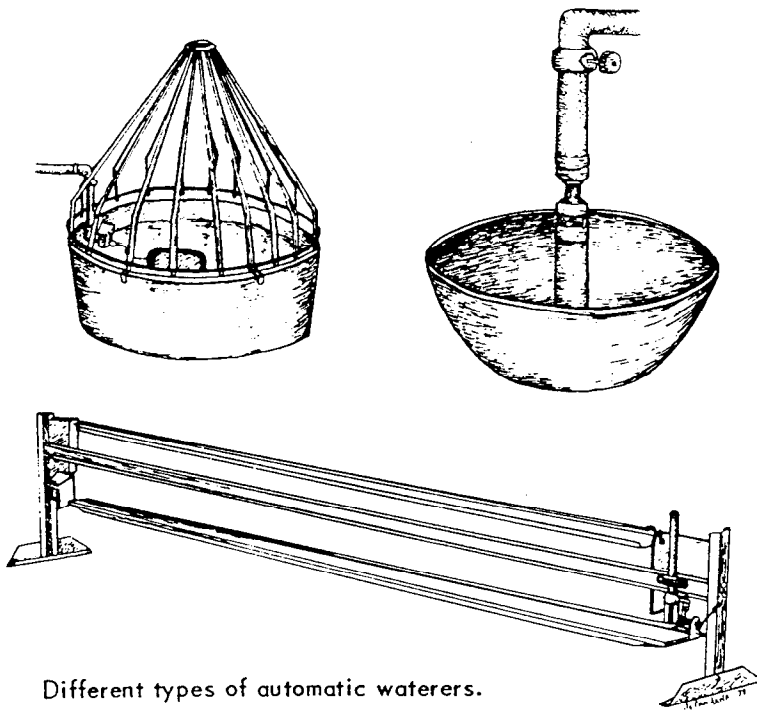
Feeding Trough for Adult Hens

In selecting equipment, enough feeder space should be provided, so that all birds can eat at one time. Waterer capacity should be adequate to insure a continuous supply. The following table can be used as a guide.

Age	Eating Space (per bird)	Waterers
0 - 2 weeks	1"	1 gal. capacity per 50 birds
2 - 6 weeks	2"	1 gal. capacity per 20 birds
7 - 20 weeks	3"	1 gal. capacity per 10 birds
laying hens	4"	1 gal. capacity per 10 birds

### ROOSTS

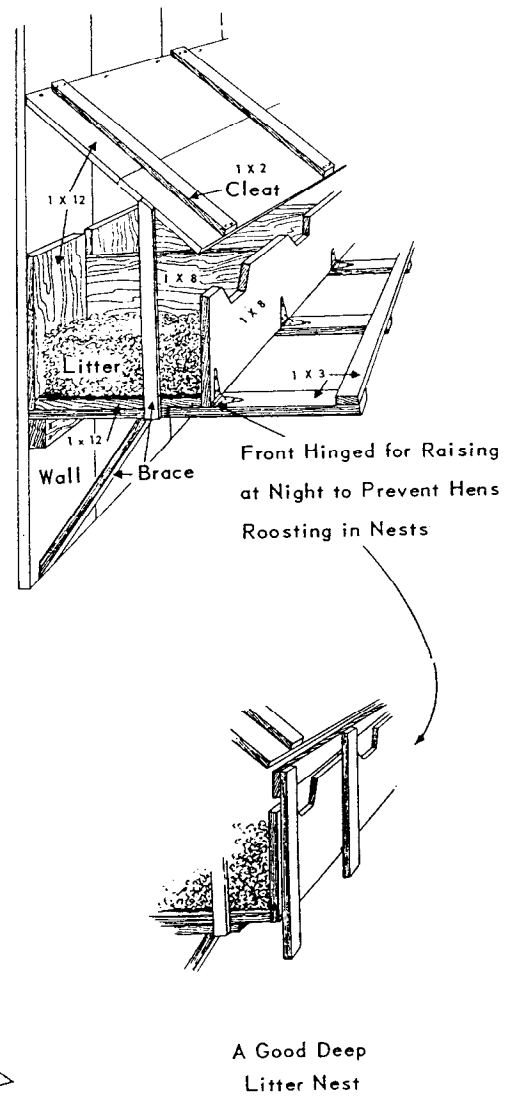
Roosts are not essential, but they are preferred by many growers. Pullets should have 6 inches of roost space per bird after 6 weeks of age. Adult chickens should have 6 to 8 inches of roost space per bird. If space is insufficient, birds may injure themselves fighting for roosting space. Roosts made from 2-inch lumber should be set 13 to 15 inches apart.



Different types of automatic waterers.

### NESTS

Properly designed nests with clean litter should be provided for laying hens. Either individual or community nests work well. One individual nest or 1 square foot of community nest will accommodate 4 hens. Individual nests should be at least 1 foot square and 1 foot high. Community nests can be any size, but must be provided with at least two openings 8 inches by 8 inches for every 20 square feet of nest space (minimum two holes per nest). To darken nests place a cloth flap to cover two-thirds of each opening. A perch should be placed below the openings for easy access.





## CAGES

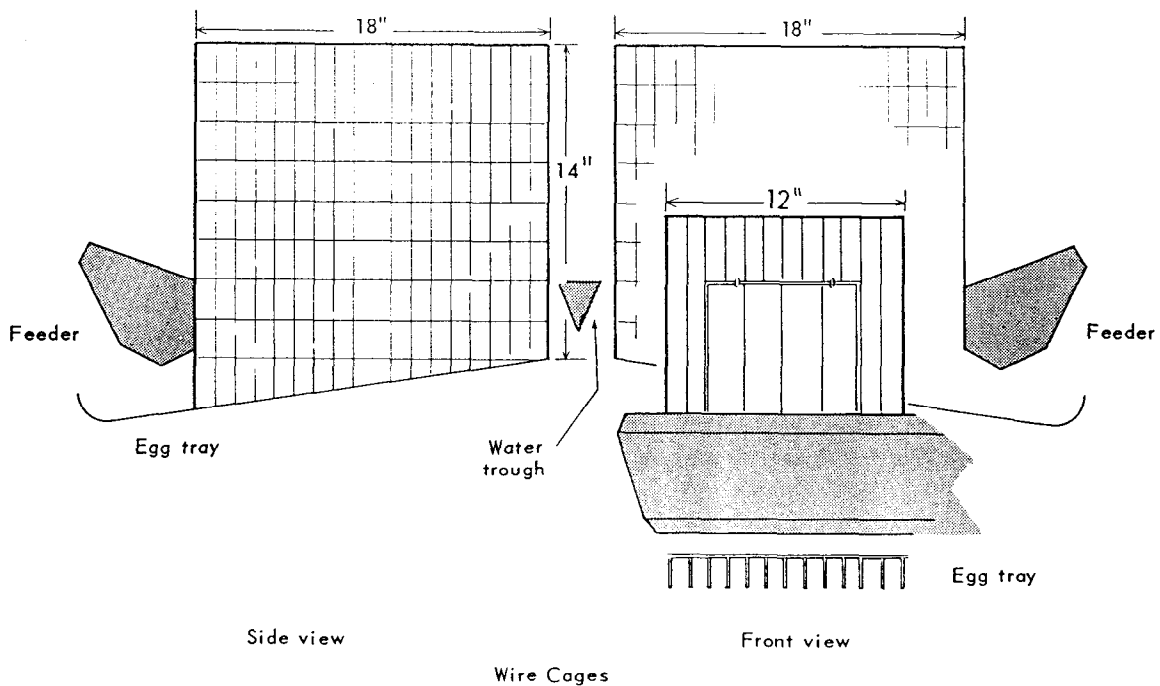
Birds may also be housed in wire or plastic cages. The cages may be located in an open building or in closed fan-ventilated housing. Cages make care easier, but birds in cages are more susceptible to the effect of extreme weather conditions. Protection from wind, cold, and particularly from hot weather must be provided. Cages are usually constructed of 1-inch by 2-inch welded wire. The floor should be constructed with a slope of 2 inches per foot so that eggs will roll out properly. The floor should extend 8 inches beyond the front of the cage, with curved lip, so that the eggs will stop gently.

Cages can be any size, but should not exceed 20 inches in depth for best results. Cages 12 inches wide, 18 inches deep, and 14 inches high are very popular. Allow 4 inches of cage front per Leghorn-type hen (3 hens in a 12- by 18-inch cage). Larger breeds require 6 inches of cage front per bird (2 hens in a 12- by 18-inch cage).

A common arrangement is to place 2 rows of cages back to back with a line of feeders on the front of each cage row and a 1½- to 2-inch-deep V-shaped water trough or line of poultry drinking cups at the back between the cage rows. The feed troughs should be about 4 inches deep, 6 to 7 inches wide at the top, and slope inward to between 3 and 4 inches at the bottom. The inside top of the trough should have a 1- to 1½-inch lip to reduce feed wastage.

## CAGE MANURE MANAGEMENT

The manure under the cages should be accumulated in as dry a condition as possible. To this end, fresh manure may be collected initially on a layer of dry poultry droppings 8 to 12 inches deep. As it collects it should be protected from water spillage. Where adequate manure drying during accumulation is impossible, the wastes should be removed regularly, at least once each week, and spread or stored properly, to prevent any fly development or excessive odors. Poultry manure lends itself well to composting.



## BROODING CHICKS

The artificial brooding of chicks has been so successful that natural brooding is now infrequently used. A brooder stove or infrared heat lamp will provide a convenient heat source. Allow 10 square inches of hover space per chick or provide one 250-watt heat lamp for 50 chicks. The use of at least two heat lamps is recommended, since bulbs may fail. Suspend heat lamps 18 inches above the floor, but do not hang them by the electric cord.

When a brooder stove is to be used, attach it to the ceiling with a pulley-guided rope; this will facilitate the easy raising of the stove to observe the chicks. Set the temperature at 90° to 95° F. during the first week; lower the temperature 5° F. per week until the hover temperature is equal to room temperature. Temperature should be measured at the height of the chicks' backs, 3 inches inside the hover. The best guide for adjusting the heat is the comfort of the chicks. If they crowd near the heat source and seem cold, the temperature is too low. If the chicks tend to settle a few inches from the hottest area, the temperature is about right.

### PREPARING FOR CHICKS

Remove old litter from the house about a week before new chicks are expected. Thoroughly clean and wash the brooding area including the walls and ceiling; wash all equipment to be used in brooding. Sanitize the house and equipment with an effective disinfectant; a solution of lye, phenol, chlorine, iodine, or quaternary ammonium compounds can be used. Lye should not be used on metal equipment. In using any disinfectant, carefully follow the instructions on the label. Some of these materials are toxic to both people and chickens.

After the pen is dry, place 2 to 6 inches of dry litter on the floor. Materials like pine shavings, chopped straw, or rice hulls make good litter. The litter is often covered with paper for the first few days. Rough paper such as construction paper or old newspaper is preferred.

When ready, place the brooder stove or heat lamp in the pen. Start the heat and operate it for 24 hours before the chicks arrive; this will warm the pen and insure proper adjustment of temperature.

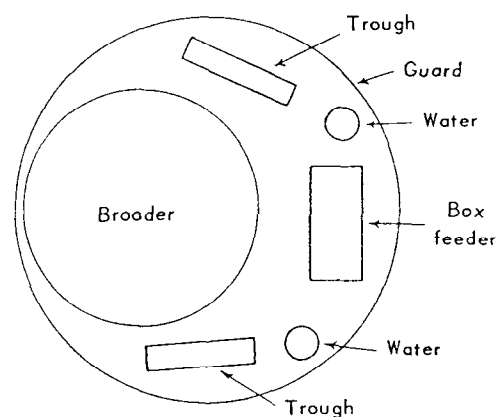
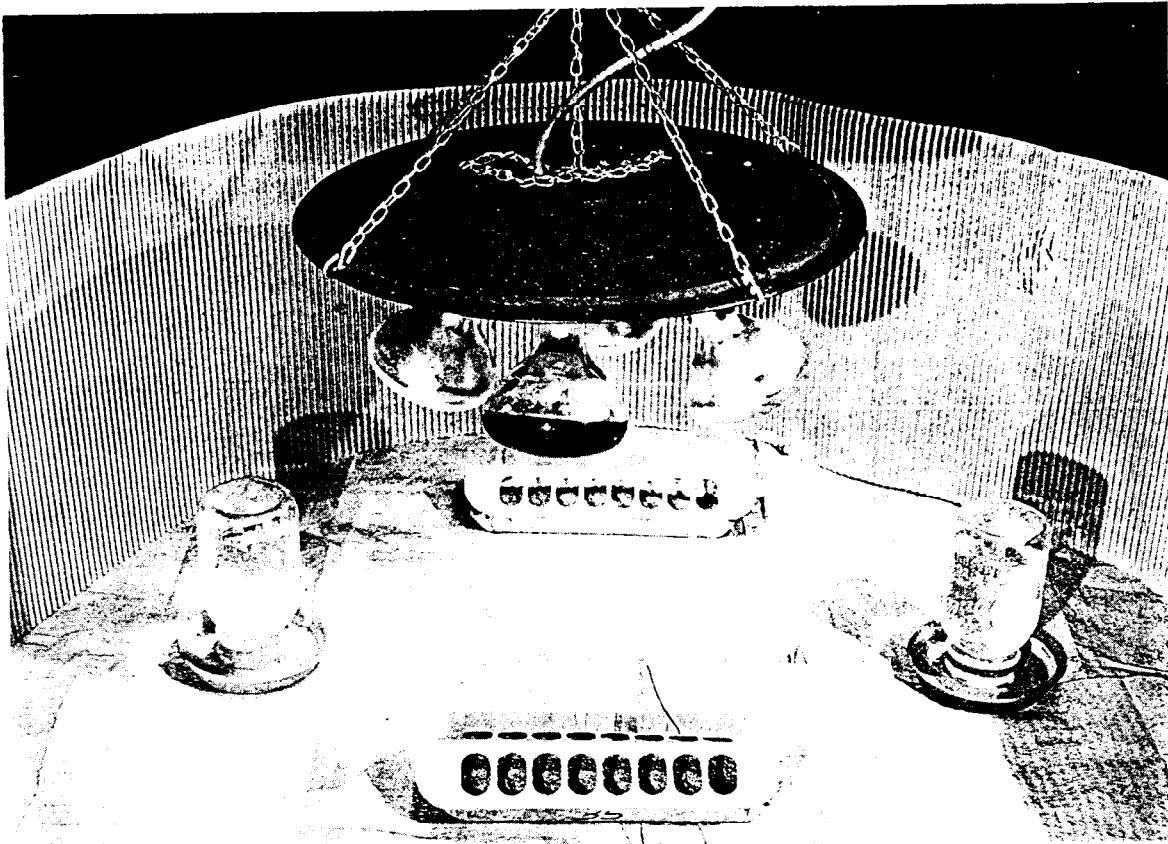


Diagram of Brooding Area

Place feeders and waterers in position before the arrival of the chicks and fill them. During the first 2 or 3 days, put feed on the paper floor or in box tops, so that all chicks learn to eat. Gradually move the feeders and waterers away from the immediate vicinity of the brooder, so that the chick activity is spread throughout the floor area. Keep fresh feed and water in front of the birds at all times.

A solid chick guard should be placed around the brooder during the first few days. The guard protects the chicks from drafts, keeps them close to the heat, and provides a pen without corners so that chicks cannot pile and smother. Gradually enlarge the circle; remove it completely after 4 to 7 days.

During the brooding period, and up to 3 weeks of age, provide chicks with a low level artificial light 24 hours a day. One 40-watt bulb provides adequate light for pens up to 20 feet square.



Brooding Area Electrically Heated.

## PULLET PRODUCTION

Between 3 and 22 weeks of age allow only natural daylight or provide decreasing light, using a time clock to control the lights. For more details, consult *Lighting for Poultry*, Leaflet 21067

The brooder should remain for a week after the heat has been turned off; at that time it may be raised against the ceiling or removed. Chicks may then be taught to roost; this can be done by feeding and watering the birds in and around the roost area until the birds become acquainted with the roosting process.

During the growing period, maintaining relatively dry litter is important, particularly when a coccidiosis preventive drug<sup>3</sup> is not used. Place waterers on raised wire platforms for chicks to stand on while drinking. Do not give stock access to the area underneath the platforms. Careful litter management can prevent health problems and allow birds to develop normally.

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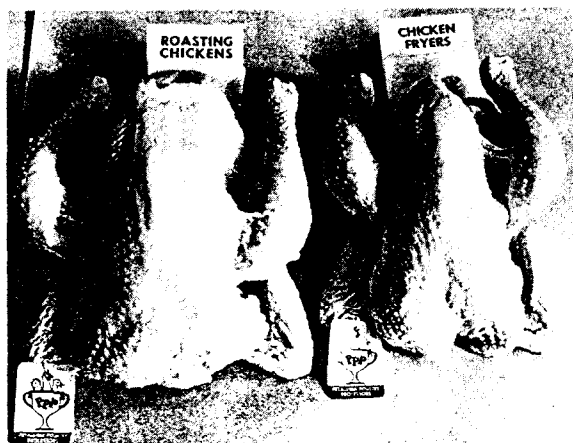
<sup>3</sup>Coccidiosis preventive drug—coccidiosis is a disease of poultry caused by certain kinds of protozoa called coccidia; several preventive drugs are approved for continuous feeding to chickens.

# MEAT PRODUCTION

Economic poultry meat production requires the proper combination of stock, environmental conditions, feed, and care. Commercially marketed fryers (broilers), Cornish game hens, roasters, and capons are produced from meat-type cross-bred poultry. Fryers are birds weighing between 3 and 5 pounds, and are marketed between 7 and 9 weeks of age. Cornish game hens, often called Rock Cornish game hens, usually are a Plymouth Rock-Cornish cross marketed at 1½ to 2 pounds live weight. Males are processed at 4 to 5 weeks of age and females at 5 to 6 weeks. Roasters weigh between 5 and 8 pounds and normally reach market weight between 12 to 15 weeks of age. Capons are surgically castrated cockerels, usually sold as heavy roasters at 5 months of age.

Once the birds have reached the desired weight, they may be processed at home or sold to a commercial processing plant. Birds to be processed should be deprived of feed for a period of 8 to 12 hours before being killed.

Meat stock is usually housed in litter-floor housing. The information previously indicated in relation to floor space, building preparation, brooder operation, and early management applies also to meat stock. Special fryer rations should be used.



Roaster and Fryer Ready for Cooking

## MARKETING

If poultry is to be raised for sale, a buyer should be contacted before the enterprise is started. Large processors usually will not purchase small lots of poultry.

State and federal laws govern the processing and handling of poultry destined for sale to consumers; some direct sales to final consumers may be exempt. For detailed information, contact your local city or county health department, or the California Department of Food and Agriculture Division of Animal Industry, Bureau of Meat Inspection.

## HOME PROCESSING

Killing is accomplished by cutting across the veins in the bird's throat; the cut can be made either from the outside or the inside of the throat. The blood should be allowed to drain.

After bleeding, scald by submerging the bird in 126° F. to 160° F. water for 30 to 75 seconds. (Special attention should be given to submersion of the wings and tail feathers.) After scalding, the feathers should be removed as rapidly as possible. Higher temperature scalding water will make picking easier. After plucking, remove pin feathers, then singe to remove any hairs (singeing is accomplished by rotating the bird over a flame).

Wash the carcass with cold water, eviscerate (remove the internal organs), and wash again thoroughly with cold water. After cleaning, chill the bird in ice water and store in a refrigerator or freezer if the bird is not to be used immediately. Chickens should never be stored above 40° F. after evisceration.

# FEEDING

The simplest way of feeding a small flock of chickens is to purchase complete mash rations from a local feed store. The suggested rations, protein levels, and approximate amounts required by chickens of different ages are shown in table 1. For best results, adjust the height of the feed troughs to the height of the chickens' backs, so that they can eat comfortably. To prevent feed wastage, don't fill the troughs more than half full. Feed troughs should be emptied and cleaned periodically to avoid accumulation of stale or moldy feed.

Flock owners may wish to supplement the complete feed with pasture or green chop (lawn clippings); young, tender plants provide a valuable supplement for chickens, but old, fibrous plants are not well digested and are of little value. Chickens may begin pasturing at any age as long as weather is favorable.

## WHOLE GRAIN

Feeding whole grain by spreading it on the litter is a common and useful practice because it induces hens to scratch in the litter and maintain it in good condition. If excessive amounts of grain are fed, hens will become overly fat. When

a complete 15 percent protein-laying feed is being used, do not feed more than  $\frac{1}{2}$  pound of grain per 10 hens daily.

Sometimes higher protein-laying mashes are available that will allow the feeding of more grain. A 20 to 22 percent protein-laying mash is sold that can be fed, free choice, with grain in feed troughs, or by spreading  $1\frac{1}{4}$  pounds of grain per ten hens on the ground daily. A rule of thumb is to feed the amount of grain that the hens will clean up in 20 minutes.

## GRIT

If feeding whole grain or grass, chickens should also receive grit. Grit is available in chick or hen size. Continuous feeding is not necessary, but grit should be available, free choice, 2 or 3 days per month.

## CALCIUM

Egg laying hens require large amounts of calcium for egg shells; an excellent way to provide it is by free choice feeding of oyster shells or calcium grit. Egg shells can be saved and fed back to the hens. Laying mashes containing  $2\frac{1}{2}$  to  $3\frac{1}{2}$  percent calcium supply an adequate amount of calcium.

TABLE 1. Nutritional Requirements of Chickens.

Breed	Age (weeks)	Expected Body Weight Range of Pullets* (pounds)	Daily Feed Required for 10 Birds (pounds)	Protein Required (percent)
Leghorn or equivalent light breeds	4	0.5 - 0.7	0.5 - 0.7	20 - 22
	8	1.2 - 1.7	1.0 - 1.2	16 - 18
	16	2.6 - 3.6	1.3 - 1.6	12 - 14
	24	3.5 - 4.5	1.9 - 2.6	15 - 16
	32 (60% egg production)	3.8 - 5.0	2.2 - 2.8	15 - 16
Plymouth Rocks or equivalent heavy breeds	4	0.8 - 1.2	0.6 - 1.0	20 - 22
	8	1.6 - 2.4	1.2 - 1.5	16 - 18
	16	3.0 - 4.0	1.6 - 2.5	12 - 14
	24	4.0 - 5.7	2.0 - 2.9	15 - 16
	32 (60% egg production)	5.0 - 7.0	2.4 - 3.5	15 - 16

\* Varies with breed or strain

## PELLETS

Commercial feeds are sometimes available as pellets or crumbles. These forms are very acceptable but have little advantage over mash. They may reduce feed waste or wind loss in some situations.

## CAUTION

Laying mash should not be fed to chicks or growing poultry since the high calcium level

may cause kidney damage. It may be desirable to use feed containing coccidiosis preventive drugs with meat poultry and laying replacement stock. However, when a drug is used, be sure it is approved for the type of poultry to which it will be fed. Feed manufacturers assist by labeling feed according to type and age of poultry, i.e., starter, grower, laying feed, etc.

# CANNIBALISM

Chickens begin to peck soon after they are hatched and they carry on this habit throughout their lives; pecking is useful since chickens learn to eat with almost no training. However, if the birds begin to peck each other, injury and death often result.

## FACTORS CONTRIBUTING TO CANNIBALISM

- Crowding
- Nutrient deficiencies
- Too much light
- Too much heat (hot weather)
- Idleness
- Blood on injured birds
- Inadequate eating or drinking space

Cannibalism is difficult to control, once it has started. Prevention by control of the contributing

factors is recommended. Additional control can be accomplished by debeaking or by the use of anti-pick devices.

## DEBEAKING

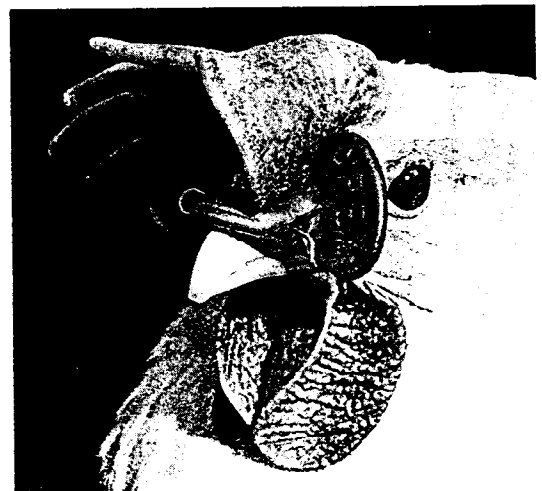
Chickens can be debeaked at any age. Remove about two-thirds of the upper beak and one-third of the lower beak with a heated blade. The cut should be cauterized to prevent regrowth, bleeding, or infection. A special instrument known as a debeaker is used.

## ANTI-PICK DEVICES

Several devices have been used to prevent picking in adult birds. These include bits, specs, and pick guards of various designs. They can easily be attached and have the advantage of not requiring special instruments.



Pullet After Debeaking



Hen With Specs

# MANAGEMENT FOR EGG PRODUCTION

## LIGHTING

Under natural daylight conditions chickens will usually lay most of their eggs in the spring, as the days lengthen. Higher, more consistent egg production can be obtained if artificial light is provided.

A useful rule of thumb for lighting laying hens is that the length of the light period should never be allowed to decrease. A minimum of 15 hours of light per day is recommended. All-night lights are probably the most practical for small flocks. One 40-watt incandescent bulb, placed in the center of the pen, provides adequate light for up to 100 hens. In general, you need 1 watt for every 5 square feet of pen to be lighted.

Artificial light should be started when pullets reach 22 weeks of age. For more information, see *Lighting for Poultry*, Leaflet 21067

## AGE AND EXPECTED EGG PRODUCTION

Chickens lay best during their first production year, starting at about 22 weeks of age. They can be expected to reach a peak production varying from 60 to 90 percent at about 34 weeks of age. Following this peak, the rate of production will decline until a molt occurs. Commercial flocks are usually processed for meat after 14 to 20 months of egg production, unless they are force molted.

## MOLTING

Molting, or feather loss, is a natural occurrence in chickens; its frequency varies according to inheritance and environment. Breeds and strains that have been selected for high egg production are less prone to frequent molting. Hens may molt if feed or water is withheld, during cold weather, decreasing light periods, or during disease outbreaks.

When a molt occurs, egg production usually stops for a period of 2 to 6 weeks. In commercial flocks, uniform molting is induced at regular intervals as a means of improving egg production and quality.



Molting Hen

Winter production pauses accompanied by a molt are common in small flocks; they can be prevented to some extent by providing proper lighting, adequate protection from cold weather, and feed and water at all times.

Random pauses in egg production will occur with most hens some time after the first year of lay; the pauses will recur periodically if hens are kept beyond 2 years of age.

## BROODINESS

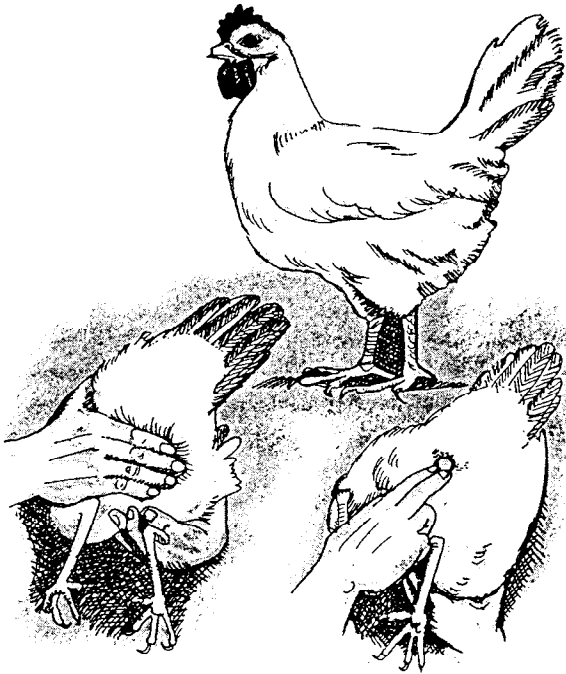
Broodiness, detected when a hen sits on its eggs, can be a worthwhile characteristic when natural reproduction is desired, but it is not compatible with high egg production. Broodiness can be broken up by placing broody hens in a wire-floored cage for 5 to 7 days.

## CULLING

Culling to remove poor layers can be a useful practice, particularly as hens pass 1 year of age. Poor layers will consume feed worth more than the value of the eggs they lay. Sick hens should be removed from the flock and disposed of immediately.

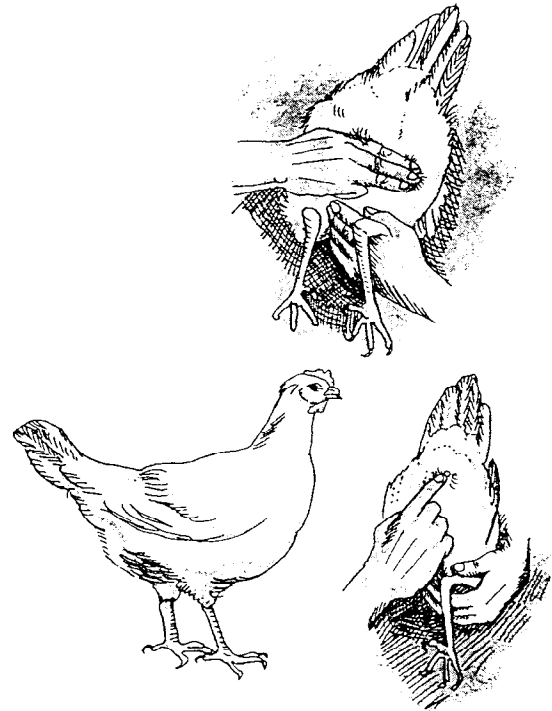
### CHARACTERISTICS OF A LAYING HEN

- a bright red comb
- a soft, pliable abdomen
- a large, oval, moist vent
- 3 to 4 fingers' spread between pubic bones and between pubic bones and keel
- no molting or growing of new feathers



### CHARACTERISTICS OF A NONLAYING HEN

- a dull, shriveled comb
- a hard and often fat abdomen
- 1 to 2 fingers' spread between pubic bones and between pubic bones and keel
- molting and growing of new feathers



## EGG CARE AND STORAGE

Eggs for table use should be collected frequently, cleaned and stored; the best storage conditions are at 55° F. and 80-to 85 percent relative humidity.

A household refrigerator can be used for storage of eggs from small flocks, but the low humidity will cause air cells to enlarge rapidly. Eggs may absorb off-flavors if stored with other produce such as onions.

Sandpaper, emery paper, or steel wool are useful for dry cleaning eggs. Egg washing is not recommended for small flock owners, but if washed, an egg wash containing a sanitizer should be used in water held at 115° F. Washing should

not exceed 2 to 3 minutes and should be followed by rapid drying and cooling. **Never wash eggs in cold water.**

Egg quality declines as eggs get older, but the nutritional value is not affected; eggs should normally be used within 2 weeks after being laid.

### MARKETING

Surplus eggs are often marketed by small flock owners. State laws in California establish certain minimum grade standards and sizes for shell eggs. Consult your County Agricultural Commissioner for details about these regulations.



## DISEASE CONTROL

In any chicken flock some losses will occur. A disease in your flock is usually manifested by a drop in egg production, reduced feed consumption, and several sick or dead birds. When a disease is evident, seek the advice of a veterinarian. The indiscriminate use of drugs or antibiotics is not advisable; sometimes the use of the wrong drug may actually worsen the disease. Frequent use of drugs or antibiotics is usually a waste of money.

The California Department of Agriculture has diagnostic laboratories staffed by trained veterinarians who will examine birds and give suggestions for appropriate action, if a disease is found. A fee is charged for this service. A sample of two to seven sick or recently dead birds should be put in a disposable container and taken to the laboratory (or veterinarian) as soon as possible after the disease is observed.

California Department of Agriculture and county poultry pathology laboratories are located as follows:

Livestock and Poultry Pathology Laboratory  
P. O. Box 9702 (3290 Meadowview Road)  
Sacramento, California 95823  
Area Code 916 - 428-3172

Livestock and Poultry Pathology Laboratory  
1500 Petaluma Blvd., South  
Petaluma, California 94952  
Area Code 707 - 762-7386

Poultry Pathology Laboratory  
P. O. Box P (Fulkerth Ave. & Soderquist Rd.)  
Turlock, California 95380  
Area Code 209 - 634-5837

Livestock and Poultry Pathology Laboratory  
P. O. Box 11585 (2789 South Orange Ave.)  
Fresno, California 93774  
Area Code 209 - 266-9418

Livestock and Poultry Pathology Laboratory  
P. O. Box 255 (714 South Santa Anita St.)  
San Gabriel, California 91778  
Area Code 213 - 282-6127

San Diego County Veterinarian  
Building 4, 5555 Overland Ave.  
San Diego, California 92123  
Area Code 714 - 565-5395

Many diseases can be prevented by good husbandry. Careful daily cleaning of water troughs is important; periodically, waterers should be washed with a sanitizing solution such as a diluted chlorine bleach. Litter should be maintained in good condition without caking or wet spots.

Adequate ventilation is needed to maintain the birds' health. Avoid a build up of ammonia in the air; when ammonia fumes cause your eyes to water, increase ventilation. Protection against low temperatures is important but not at the expense of reasonably fresh air.

If birds that appear dead or sick are not removed immediately, they can be a source of infection to the rest of the flock. If sick birds are highly prized, they may be confined and treated in a separate area - this procedure is not recommended.

The flock should be examined regularly for sick birds, poor litter conditions, or any other problems.

## VACCINATION

Vaccination is desirable to protect against certain diseases. Vaccines or bacterins are available to control Marek's and Newcastle diseases,<sup>4</sup> Infectious Bronchitis,<sup>5</sup> Infectious Coryza,<sup>6</sup> Laryngotracheitis,<sup>7</sup> Fowl Pox,<sup>8</sup> and Epidemic Tremor<sup>9</sup> (Avian Encephalomyelitis). Vaccines vary in their ability to protect birds against specific diseases; careful application of the vaccines following instructions on the package is essential to obtain a good immunity with the use of any vaccine. **It is generally recommended that you do not vaccinate for any**

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<sup>4</sup> Newcastle disease—a viral disease of poultry which can result in very high death losses; abnormal egg shells and nervous signs (paralysis) are common.

<sup>5</sup> Infectious Bronchitis—a viral disease of chickens characterized by sudden onset, respiratory symptoms, and abnormal egg shells.

<sup>6</sup> Infectious Coryza—a chronic or acute respiratory disease of chickens caused by the bacterium, *Haemophilus gallinarum*.

<sup>7</sup> Laryngotracheitis—a respiratory disease, caused by a virus, resulting in extremely difficult breathing in chickens.

<sup>8</sup> Fowl Pox—a viral disease which often causes wart-like scabs on unfeathered portions of chickens' bodies.

<sup>9</sup> Epidemic Tremor—a viral disease resulting in nervous symptoms. Primarily a disease of young chickens.

disease unless it is a problem in your area or on your property. University of California farm advisors are available in most counties to advise you about the need for vaccination in your area.

## COCCIDIOSIS

Coccidiosis is one of the most common diseases affecting domestic poultry. Good litter management will minimize the problem.

Coccidiosis preventive drugs, available in chicken feeds, are quite effective. Chickens develop resistance after continued exposure to a species of coccidia. If you use a coccidiostat be sure it is approved for the type and age of the chickens you are feeding.

## PARASITES

External parasites such as mites, lice, and ticks occasionally affect chickens; they can be safely controlled with certain pesticides. When using chemicals, always read the instructions carefully and follow them exactly.

Internal parasites (worms) most often occur in chickens on litter or in outside runs. Starting new broods on clean range is helpful. Treat birds as recommended by a veterinarian and only after a diagnosis has indicated the presence of worms.

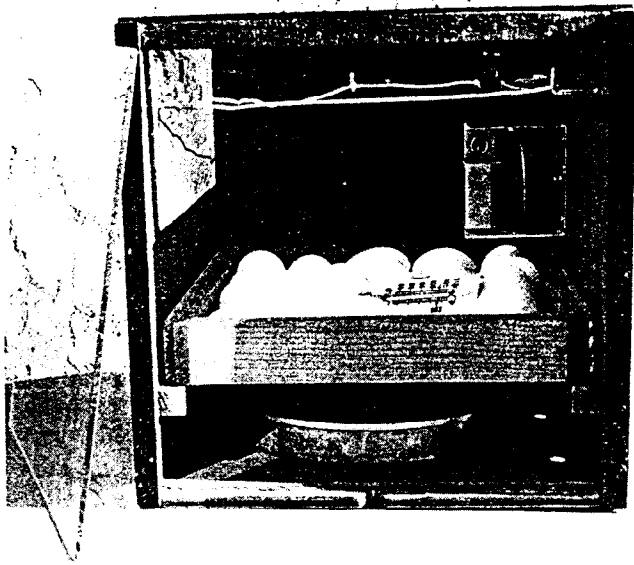
# REPRODUCTION

Small flocks can be propagated by natural incubation and brooding. Although roosters vary considerably in the number of hens they will fertilize effectively, at least one rooster in good health should be kept for every 10 to 25 hens. Hens can be encouraged to go broody by leaving real or artificial eggs in their nests and by providing dark undisturbed nesting areas. General-purpose breeds (such as New Hampshire, Plymouth Rock or Rhode Island Red) usually make good setters and effective mothers.

A large broody hen can cover 12 to 14 chicken eggs. Some poultrymen number or date the eggs which they

leave in the nest to encourage broodiness. When a persistent setter is identified they may replace some or all of these eggs with fresher eggs judged more likely to hatch. Turkey, quail, pheasant, guinea fowl, duck or geese eggs can also be incubated under broody chicken hens. Once a broody hen is "set" it is advisable to avoid disturbing her because she might abandon the eggs.

Artificial incubation requires much care, but it can be done at home and makes an interesting project for children. For more information, see Leaflet 2653 "Incubating Eggs in Small Quantities."



Artificial Incubator—  
With Electrical Heating

## FAILURES

Not all eggs hatch, even under perfect conditions. Often, 10 to 20 percent will be infertile and another 10 percent will die during incubation. If many of your eggs fail to hatch, the eggs may be infertile. You can tell if

eggs contain developing chicks by candling them. Cut a 1-inch diameter hole in a board, cardboard box or tin can; then place a bright light behind the hole. Examine the eggs in a darkened room by holding the large end up to the lighted hole. After 5 days of incubation, the embryo should be clearly visible.

Light Used for  
Candling Eggs.

