

some
poultry
problems

(9)



λ351:7,5.231

J2

31993

λ351:7,5.231

J2

031993

and how to solve them

SOME POULTRY PROBLEMS AND HOW TO SOLVE THEM

September 1952

**ISSUED BY THE DIRECTORATE OF PUBLICITY
GOVERNMENT OF BOMBAY, BOMBAY**

In raising poultry for home consumption or the market, poultry-keepers meet with several problems. On how successfully these problems are tackled depends the success of the enterprise. This small booklet explains how the more important of poultry problems can be solved with the means available with the average poultry-keeper. It is published in the hope that it may prove useful to those already in the line or those intending to take up poultry-keeping as a profession or a hobby. Incidentally, it gives an insight into the various schemes that the Bombay Government has launched to put poultry-keeping in the State on a firmer and more economic footing.

CONTENTS

	PAGE
POULTRY PROBLEMS AND THE STATE	5
THE PROBLEM OF BREEDING AND FEEDING	11
THE PROBLEM OF SELECTING BREEDING FOWLS	17
THE PROBLEM OF HOUSING	23
THE PROBLEM OF DISEASE MENACE	27
THE PROBLEM OF SANITATION AND MANAGEMENT	32
THE PROBLEM OF FIGHTING RANIKHET	35
THE PROBLEM OF HATCHING EGGS	38
THE PROBLEM OF THE SUMMER EGG	41
THE PROBLEM OF MARKETING EGGS	47



*A flock of pure Leghorn birds on free range.
Leghorns are famous for high egg-production.*

POULTRY PROBLEMS AND THE STATE

Very nearly two and a half lakhs of the total number of eggs consumed by city-dwellers in Poona and Bombay last year came from village poultry-keepers in the Sholapur District, who pool their produce and leave it to the Poultry Development Section to find for them the best possible price and a reliable market under the egg-collecting and marketing scheme run by the Government of Bombay. The eggs are collected, cleaned, graded, candled, packed and marketed in the cities by the Poultry Section.

The scheme, intended to help small poultry-keepers scattered about in various villages in the intensive poultry-producing areas of the Pandharpur and Sangola talukas of the Sholapur district realise better profits for their produce through an organised market, has provided incentive to these village producers to run poultry-farming on the right lines, pay greater attention to the rearing and management of their flocks, and also keep diseases off their flocks. The scheme provides for regular inspection and vaccination of birds against poultry diseases, in addition to supplying the farmers with eggs or birds of better breeds for breeding and improving the flocks.

This and other schemes of the Government of Bombay have swung poultry keeping in the State from a non-descript and not very economic proposition to a worthwhile subsidiary occupation, and in many cases, to a profitable, independent venture all over the State.

In 1947, realising that an increased production of eggs and table birds was necessary to ease the difficult food situation in the State, the Government set up a full-fledged Poultry Development Section to work under the State's Animal Husbandry Department. Now, the Section is attached to the State Department of Agriculture.

The Section's main programme has been the extension of poultry-keeping throughout the State through education and advice on the proper methods of running poultry units. Other schemes provide monetary help to stragglers or those who cannot take up this work all on their own.

Side by side, research work to tackle the various problems common to poultry-farming has also been set going on the State's Central Poultry Farm at Kirkee. Thirteen Poultry Breeding Farms in all established in various parts of the State, breed pure-bred birds and hatching eggs for supply to those intending to develop their flocks or start new ones. The Poultry Farms are situated in Kirkee,

Dhulia, Dharwar, Kurduwadi (Sholapur), Sangola (Sholapur), Nasik, Borgaon (North Satara), Arbhavi (Belgaum), Kumta (Kanara), Bagalkot (Bijapur), Kolhapur, Kopergaon (Ahmednagar) and Ahwa (Dangs).

At these farms, over 6,000 birds of various breeds are maintained to help production of eggs and chicks for distribution to farmers. Annually, about 15,000 hatching eggs and 3,600 day-olds to adult birds are distributed to farmers all over the State. Egg-production on these farms exceeds annually 89,000, of which the farms retain 22,000 for their hatching requirements. Seven hundred table birds and over half a lakh eggs are also sold for consumption to the public at these farms.

In Rural Areas

In the rural areas of the State, poultry farmers are being put on their feet by supplying them with pure-bred fowls and hatching eggs, and the Section's experts visit private farms, inspect the flocks and advise on the methods of rearing and management. Organising periodical poultry shows and rallies in various parts of the State to focus the attention of the public on the need for breeding better birds and awarding prizes for the best birds brought by farmers also form a part of the work of the Section. Poor farmers are encouraged to

fare better in the venture by the award of egg and fowl and housing premia.

The supply of breeding fowls and hatching eggs to bona fide farmers is made at concessional rates. Subsidies in the form of birds, wire-netting, incubators and cash, amounting to Rs. 10,000 every year, are awarded to deserving poultry farmers.

Poultry Units

Another feature of work, no less important than others, is the running of poultry training classes at three of the State's poultry farms. Annually, at the poultry farms in Kirkee, Dharwar and Dhulia, two classes, one of three months' duration and the other of nine months' are conducted, where complete training in the scientific methods of breeding, feeding and management are taught to would-be poultry farmers. Eighty to ninety farmers every year get such training and return to their villages to get going with their new knowledge. Backward Class students get scholarships to aid them to attend these classes, and such scholarships at present amount to Rs. 1,700 each year. Those who stand first and second in the test conducted at the end of the course go home richer by Rs. 40 and Rs. 30, respectively, those being the prize amounts. Such of the home-returning boys as require some funds to start poultry-keeping get

loans from the Government up to Rs. 500 to start on their foundation stock.

Poultry units are also established in some of the State's agricultural schools. These help in giving the right type of education in poultry farming to students attending these schools. More such units in other agricultural schools are in the offing.

Research

Visitors to the Central Poultry Farm at Kirkee see various research schemes in progress which are designed to breed suitable types of fowls suited to the various regions. This is being achieved by what poultry-breeders call in-breeding, selective breeding, cross-breeding, and up-grading. There are many other problems such as feeding, breeding and management under investigation at the farm.

One of the successful outcomes of the research work going on at Kirkee has helped poultry-farmers with deshi flocks 'up-grade' their breeding hens. Up-grading is done by crossing the deshi hen with the Rhode Island Red cock in successive generations to give the hen superior laying qualities. Farmers have learnt this technique very well and have found that the egg-laying capacity of the successive generations has increased, without increasing any additional expenditure in maintenance or feeding. An average count taken of the eggs laid by hens, when they were up-graded with

the Rhode Island Red, reads: 109 in 1947 and 171 in 1951, in the fourth generation.

The method advocated by the Section for preserving eggs produced during the summer by keeping them cool in mud pots has proved popular with farmers as an efficient but very inexpensive method which keeps off egg losses.

The system of registering poultry-keepers has helped raise poultry-keeping to a higher level, inasmuch as it has been possible for the Section to control poultry-breeding in villages by supplying them with hatching eggs and breeding fowls of better breeds and has enabled it to rid farm flocks of diseases, as these flocks are regularly protected against Ranikhet, the most dangerous disease of poultry. In the intensive poultry breeding zone alone, 725 farmers have registered themselves and are getting the benefit of improved poultry-keeping methods.

THE PROBLEM OF BREEDING AND FEEDING

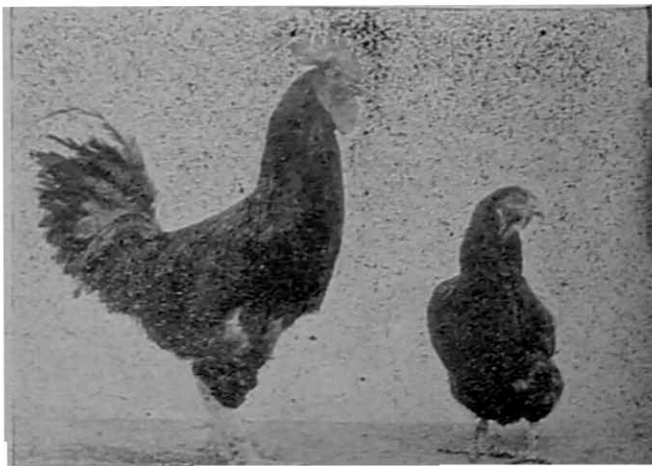
Poultry-keeping is slowly coming into its own. Farmers, big or small, can make it a highly paying industry by following the more scientific methods of breeding and rearing fowls. The poultry development schemes of the Government of Bombay aim at breeding and improving the more popular foreign breeds, cross-breeding and grading 'deshi' hens with these breeds, improving 'deshi' breeds with regard to qualities like better egg-laying, better growth, early maturity and shorter broody pauses and conducting trials with other foreign breeds to study their potentialities under Indian village conditions.

Among the foreign breeds tried in the past, the White Leghorn and the Rhode Island Red were the two most suited to our conditions, having good laying characters. From time to time the purity of the stock had to be kept up through fresh imports. But during the war-time such imports were impossible, and the Poultry Development Section was left to its own resources. Attempts were made, therefore, to evolve a breed that could equal the imported birds in egg-laying. Now a



Highly popular with poultry-keepers in Bombay State is the breed of White Leghorn. Majestic in appearance, Leghorns are noted for their high egg-production, which may be anything between 150 to 200 per annum

Originally from the U.S.A., the Rhode Island Red breed is done well in Bombay State. It is a dual-purpose breed, and is maintained both for eggs and meat. It is most suitable for the heavy rainfall areas of the State, and has proved useful in up-grading deshi fowls



strain has been evolved which lays on an average 220 eggs a year, and has a pretty long span of life. Attempts are being made to improve this strain year by year by careful selection, drastic elimination of undesirables and breeding from only proved and vigorous stock.

The distribution of improved breeds of fowls to rural areas for improving the 'deshi' birds has met with quite a good measure of success. In certain areas, where such distribution has been done, grading of country birds has now reached the sixth and seventh generations and it has been found that they have reached an economic stage. They lay large white eggs and quite a good number of them, taking into consideration the conditions of feeding and maintenance existing in our rural areas. The pause of broodiness is also found to be very much shorter than their 'deshi' parents.

In the Pandharpur and Sangola talukas, very good results have been obtained in this direction. In this area an "Egg Collecting Scheme" is in operation, by which eggs from registered poultry-keepers are collected, graded and sold both for hatching and for table purposes, at prices advantageous both to the producer and the consumer.

Another area of operation is in the Thana District, covering the important centres of

Palghar, Vada, Thana and Kalyan talukas. Due to the excellent consuming centre of Bombay being near, producers in this area find little trouble in the disposal of eggs.

In the Surat District, Chikhli, Bulsar, Pardi and Gandevi talukas, where the scheme is in operation, find a ready market for eggs again in Bombay.

Further efforts are being made to consolidate the work already done, and to start the work in new areas as well.

For the past many years, improvement work is going on at Kirkee. At this centre the progress made is quite encouraging. Economic characters in deshi breeds are being aimed at, and already an average of 160 eggs per year per hen has been achieved as against the all-India average of 80 per 'deshi' hen.

The breeds which are being tried for their suitability to Indian conditions are the Black Minorca, Ancora, Light Sussex, Aseel and the Marans. The last named two have shown some desirable qualities and further observations are in progress.

In Bombay State an association, called the Bombay State Poultry Association, is being run by poultry-breeders who have a variety

of breeds to their credit. Many villagers who are actively interested in poultry-farming are members of this Association. The Association holds annual shows at Poona which are open to exhibitors from all over India. Villagers have a separate section to exhibit their birds and which generally occupies half the space of the exhibition. This show gets a subsidy from the Government.

The biggest hurdle in the smooth propaganda and working of the poultry schemes and intensification of breeding is the scarcity of food for poultry. Apart from what the poultry pick up from the open spaces in villages, a laying hen requires a fair quantity of nutritious food to maintain her body-vigour while she is laying continuously. Grain problem is difficult in India to-day; yet grain, which is unfit for human consumption can very well be used for feeding poultry. Poultry need cereals and a small quantity of pulses. Compared with a milch cow or a buffalo, a laying hen is a creature that works more intensively. A cow can consume, in the absence of grains, a large quantity of dry or green leguminous fodder. But a hen cannot consume more than $4\frac{1}{2}$ ozs. of grains, greens and all. Making use of this food, we expect her to lay an egg a day, an egg weighing from $1\frac{1}{2}$ ozs. to $2\frac{1}{4}$ ozs.

in weight. This she must do and at the same time maintain good condition. Hence the problem of finding grain for feeding poultry has become a difficult one. As a result, in towns and suburbs of towns some progressive poultry farmers have been forced to reduce their poultry stock.

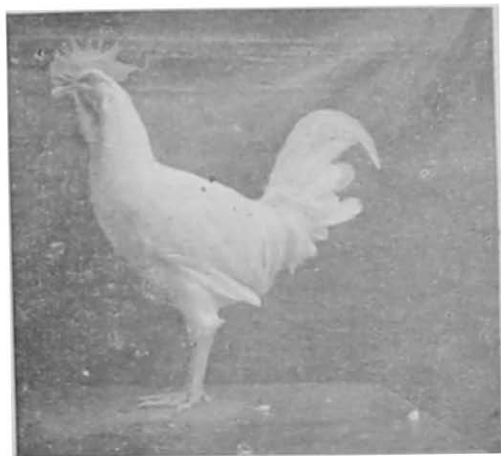
It is proposed that side by side with the propaganda for production of more poultry and eggs, an effort be made to process poultry foods in collaboration with municipal slaughter houses and fish drying yards to make up a food which can be added as "spices" to the ordinary food. Such a food, consisting of meat offal, fish proteins, bonemeal, and other minerals and spices, will be a great help to poultry-keepers in suburban and rural areas.

Considering the difficulties one has to face in the State, the quickest way of stepping up poultry-keeping and egg production, seems to be by the distribution of more improved and graded cocks, hatching eggs, and evolving a sure method of preservation of eggs during hot months when a large number of eggs generally go bad. Formation of societies for marketing eggs after cleaning and cooling would accelerate egg production efforts, as the producer would get better prices for his produce.

THE PROBLEM OF SELECTING BREEDING FOWLS

The success of poultry farming depends upon securing a progeny having a high laying capacity, good rate of growth, early sexual maturity, and similar other desirable traits. In the flock the cock is responsible for imparting to its progeny the traits it possesses. If the cock has desirable traits, then the progeny will inherit these traits, and the poultry farmer will benefit. But if the cock has defective traits, these will similarly be transmitted to the progeny, as a result of which poultry-keeping becomes uneconomic. It is a case of 'like begetting like'. Since the cock is responsible for a large portion of the poultry population, much depends upon the kind of cock selected. It is, therefore, highly necessary that the greatest care is given to the selection of the cock for breeding purposes.

The poultry farmer should also be able to distinguish between economic birds and uneconomic birds. Among the female population there may be good layers, bad layers and non-layers. The farmer should know how to distinguish one category from the other, so that undesirable

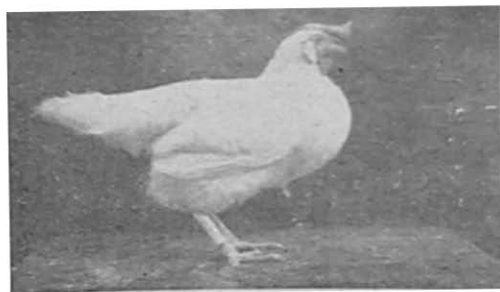


**A GOOD BREEDING MALE WITH THE
DESIRABLE TRAITS**

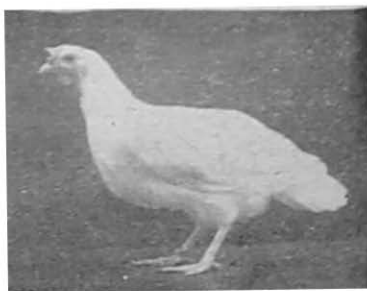


**THE MALE THAT YOU SHOULD
WEED OUT**

**A GOOD BREEDING FEMALE. OBSER-
VATION AND PRACTICE WILL HELP
YOU IDENTIFY HER EASILY**



**THE FEMALE YOU SHOULD
DISPOSE OFF. AN UNDESIR-
ABLE HEN WILL MEAN A POOR
FLOCK AND POOR RETURNS**



birds may be got rid of and only economic birds having desirable traits maintained.

In selecting a breeding male, the following points should be considered.

1. A male should preferably be one whose sisters and half-sisters have been tested.
2. A male should be physically fit at the time of mating (regardless of age, provided each individual has reached proper sexual maturity).
3. A male should be strong and vigorous (which will mean better fertility and hatchability and less mortality in chicks).
4. Head : Distinctly masculine, short and thick for the variety, and clean cut. Full of colour and life.
5. Face : Bright, well proportioned, and wider at the top than at the bottom.
6. Eyes : Bright, full and prominent; eye-rings should be white.
7. Beak : Short, heavy and curved.
8. Comb : Full and bright; points should be wide at the base and not too high.

9. Wattles : Full and bright.
10. Body : (i) Heart girth : Broader and deeper.
(ii) Width of back : Fairly wide.
(iii) Depth of body : Relatively deeper in front and as deep as the centre.
11. Skin texture : Thin and pliable.
12. Vent : Bluish white.

It is equally important to keep good laying stock for a profitable poultry proposition. The morphological characters usually associated with good and poor layers are given in the following tables, which will be of help in distinguishing layers from non-layers and good layers from poor layers.

Characteristics related to laying condition

Character	Laying bird	Non-laying bird
Comb :	Bright, red and expanded.	Dull, shrunken and covered with white scurf.
Eye :	Bright.	Dull.
Vent :	Moist, expanded, bleached.	Dry, puckered, yellow.

Beak :	Faded at base.	Yellow at base.
Pubic bone spread :	More than 2 fingers spread.	Less than 2 fingers spread.
Body capacity :	2 to 5 fingers.	Less than 2 fingers spread.

Estimating past performance at end of laying season

Character	Good	Inferior
Laying condition :	Laying	Not laying
Eye :	Bright	Dull, sunken
Earbodies :	Bleached (Leghorn only)	Yellow
Beak :	Bleached	Yellow
Shanks :	Bleached	Yellow
Plumage :	Dry, old, brittle	New
Time of molt :	Late	Early

Estimating merits of good and inferior layers

Character	Good	Inferior
Head :	Broad, square	Crow-headed, round
Beak :	Short	Long
Eye :	Bright, bulging	Dull, sunken
Face :	Lean, smooth	Meaty, wrinkled
Comb :	Large, fine	Small, coarse
Breast :	Full, broad	Shallow, narrow
Back :	Broad, long	Narrow, pinched
Abdomen :	Expanded	Small
Quality of abdomen :	Fine, pliable	Coarse, fatty

Skin :	Thin	Thick
Pubic		
bones :	Thin, fine, flexible	Thick, stiff
Shanks :	Lean, flat, fine-scaled	Fat, round, coarse-scaled
Molt :	Late, rapid	Early, slow

Observation and practice in handling stock with the help of the above tables will help you in the selection of good and desirable stock for your poultry farm.

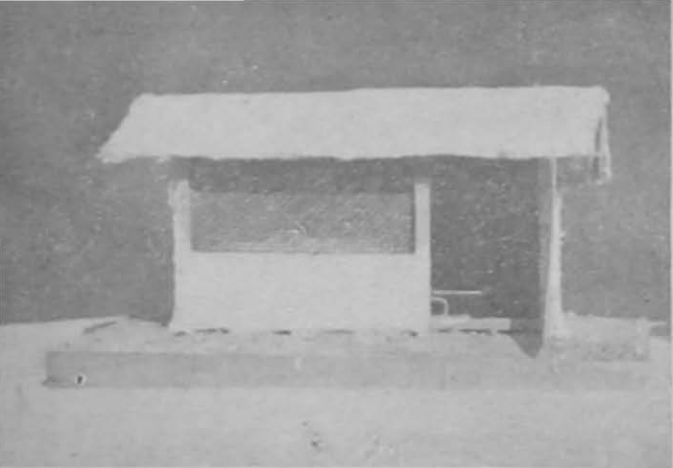
THE PROBLEM OF HOUSING

Housing your poultry birds in comfort and under hygienic conditions is very essential if the birds have to remain healthy and productive. Good housing for the birds will mean the maintenance of an economically efficient flock. A good house should provide ventilation, and sufficient space—the two basic needs of birds. As such, houses should be spacious, clean and should be provided with perches and dust baths. Overcrowding, you will agree if you are a poultry-farmer, is the main cause of getting poor returns. This has been responsible for lowering the vitality and resistance-power of the birds, making them vulnerable to the first disease that stalks into the poultry-yard.

Poor housing brings other undesirable results too. Low egg production, for example; birds looking pale, inactive, exhausted.

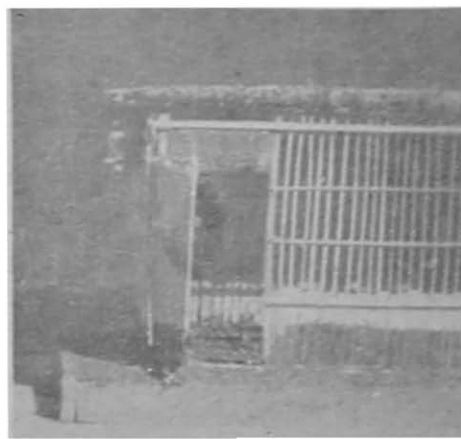
A good house should protect the fowls from severe cold or heat, according to season. Severe colds cause a blue comb, wattles; heat will cause strokes to death.

In recommending suitable types of poultry houses to farmers, the Poultry Development



A GUNNY CLOTH HOUSE

A SPLIT-BAMBOO HOUSE



Section has the benefit of experiments conducted at the Government Central Poultry Farm, at Kirkee, near Poona. Observations indicate that two types of houses can be constructed cheap, with locally available material, and hence are highly suitable for being put up by farmers anywhere in the State. They are:

GUNNY CLOTH HOUSE

The Gunny Cloth House, which measures 8' × 6' × 6' and is constructed thus: On a wooden frame of a suitable size, gunny cloth is nailed down tightly and coated once on the inside and twice on the outside with the following mixture.

The mixture consists of:

	lbs.
Cement	12
Lime	3
Common salt	1
Alum	$\frac{1}{2}$
Water	20

It is obtained by first preparing a thick liquid solution of 12 lbs. of cement in 20 lbs. of water. The solution is stirred well. While stirring, 3 lbs. of lime are added, and when it is mixed well, the lb. of common salt and $\frac{1}{2}$ lb. of alum are added. Stirring is continued till all the materials are well mixed.

A half-inch wire netting is buried a foot all round the house and a foot all round the framework above ground level to prevent predatory pests from burrowing into the house.

Such a house will cost about Rs. 25 to build and can accommodate 12 birds. Normally, it will last for two years. Sometimes due to rains or white ant attack, the bottom foot or foot and a half may get disintegrated. It would be economical, therefore, if this much portion of the house were to be so fixed as to be removed and replaced when found necessary.

SPLIT-BAMBOO HOUSE

The second type of house is the split-bamboo house. The house is made of split-bamboo and a good binding of mud plaster (cowdung and mud) 1'-6" high all along the walls from the base. Such a plastering will prevent burrowing by wild animals. The roof is thatched with hay. The house measures 8'×6'×7' (h) and will cost about Rs. 30 to put up. This can also accommodate 12 adult birds.

Farmers are well-advised to try one of the above according to their fancy or according to materials available.

THE PROBLEM OF DISEASE MENACE

Mortality among growing chickens and adult birds in our country causes a loss of many million rupees to poultrymen annually. In addition to this astounding loss, flock-owners spend several thousands of rupees more to treat sick chickens. In many cases medicines purchased are relatively worthless, as a result of which a part of the cost of the medicines should also be added to the direct losses of birds in order to obtain a true picture of what this mortality means to the farmer.

It must be emphasised at the beginning itself that the major responsibility for the high rate of mortality due to parasites or disease, or due to other causes rests with poultrymen themselves and not with the chickens. Many flock-owners also fail to realise that every chicken is a potential source of spreading parasites and diseases to other flocks. Many diseases are filth-borne and are readily spread from one place to another.

Some of the more important ways in which parasites and diseases get widely spread are listed below:

1. Eggs of parasites and disease organisms are carried from place to place through shoes and

clothing either of persons attending to the flock or of visitors.

2. Feed pails, feed sacks, shipping boxes and crates are often the means of spreading disease.

3. Rats, wild birds, insects and sometimes wind also carry disease organisms from place to place.

4. Contaminated water and dirty feed troughs are more often responsible for the spread of disease.

5. A careless disposal of manure and dead birds may cause a serious outbreak of disease.

6. Improperly balanced diets may give rise to certain nutritional diseases or may weaken the birds to such an extent that they may be unable to resist attacks or organisms of other diseases, and thus may fall an easy prey to such diseases.

7. Growing chickens and adult birds are often kept on the same land year after year. The ground thus gets more thoroughly contaminated year after year.

8. In almost all cases poultry houses are never properly cleaned or thoroughly disinfected from time to time.

9. Overcrowding in poultry houses and maintaining the birds under unsatisfactory conditions

may lower the vitality of birds to such an extent that they are unable to withstand the onslaught of disease.

10. Adult birds are often allowed to mix with growing chickens, thus exposing the latter to a potential source of infection.

11. Incubation under hens purchased from the bazaar or from an unknown flock is often a source of spreading disease.

12. Transportation of live market poultry tends to disseminate disease from one place to another.

13. Birds returned from poultry shows sometimes harbour disease.

With such a big list of the different ways in which diseases are spread, there is little wonder that mortality from disease has become one of the most important factors affecting returns secured by flock-owners. In fact, poultry parasites and diseases have become so widespread these days that it is probably too much to expect that they can be easily eradicated. On the other hand it is clearly apparent that a great deal can be done in this regard by the poultryman taking sufficient precautions to see that his flock is kept away from infection.

Since most diseases are filth-borne, it is clear

that if losses are to be kept down, such conditions as are necessary to prevent birds readily contracting diseases and spreading them among the flock have to be maintained.

The policy of preventing disease from becoming a menace is far more sounder and cheaper than trying to cure chickens after the disease has gone far into the flock.

The problem of disease-prevention is largely a problem of breeding, feeding, and management. Flock-owners who keep a sound breeding stock, feed the birds and manage them properly usually have little trouble in keeping down losses to the minimum.

The progeny of a breeding stock rigorously selected for vigour for several generations is better able to ward off diseases than a progeny bred from unselected stock. A bird with a sound constitution is definitely an advantage to the keeper. Birds lacking in vigour should never be used for breeding purposes and should be culled from the flocks as soon as noticed.

Help to reduce spread of diseases and big losses by avoiding sale of sick birds and make it always a point to hatch from broody hens selected from your own flock. Other points to remember are :

- * Give only clean and fresh drinking water to birds.
- * Put all poultry-manure in a specially prepared pit.
- * Either burn dead chickens or bury them deep.
- * Do not keep young chickens along with adult birds.
- * Build hygienic poultry houses to allow sufficient light and air. Clean and disinfect them regularly at short intervals.
- * Avoid overcrowding of birds in houses. Overcrowding devitalises birds and greatly reduces egg-production.
- * Do not keep poultry on the same land year after year, unless it is dug up and limed.
- * Feed sufficient greens (lucerne and other vegetable tops and waste) with grains.
- * Breed from vigorous and healthy birds only. Cull out weaklings as soon as noticed.

THE PROBLEM OF SANITATION AND MANAGEMENT

To operate a successful poultry enterprise it is essential that sound principles of sanitation and management are followed. Each year, many poultrymen are forced out of business due to their inability to produce and maintain healthy stock. A successful disease-control programme must be accompanied by good sanitary management practices. These results can be obtained only through constant effort and vigilance on the part of the poultryman. In general, these principles include the following :

Start with the chicks that are from stock which have proved their ability to produce healthy, vigorous birds that lay well. These chicks should be from disease-free stock, in so far as it can be determined.

Keep the premises thoroughly cleaned and disinfected at least a week before the chicks are allowed over it. Keep the hen and chicks in a well-ventilated place during the night.

Provide fresh, clean water. Put a wire cover over the water pots to keep the water clean.

The birds should be put on clean, well-

drained ground. Use a 3-year rotation of ranges if possible. Some natural or artificial shade is desirable. You can range upto 300 birds to the acre.

Protect birds regularly against diseases that may be prevented by vaccination. This can be done between the ages of 8 and 16 weeks. Diseases in chickens include fowl pox and Ranikhet.

(a) Cull pullets just before they start laying and keep birds that are healthy, vigorous and well matured. It is more profitable to keep the right number of good birds than a large number of good and poor birds in the same place.

(b) Do not crowd the birds in laying pens. Allow 4-square feet of floor space for each bird in the house.

(c) Keep dry, clean grass in laying places every week.

(a) Adult birds should not be allowed to come in contact with younger birds, since it is possible that there may be disease-carriers among the older birds, even though they appear perfectly healthy.

(b) New stock should be added only as hatching eggs or baby chicks. Older birds from the market may be carriers of disease.

(c) Birds should never be returned to the flock from shows, fairs or markets, before observing them for 10 days.

(d) All visitors should be kept out of pens.

(e) Baskets used for transporting birds to poultry markets, unless thoroughly disinfected between trips, are a dangerous source of many types of poultry diseases.

Careful observation for evidence of disease conditions in the flock must be maintained. When any abnormal condition is noted, the cause should be immediately determined and corrective action taken. This can be done by contacting the Veterinary Surgeon of your taluka.

THE PROBLEM OF FIGHTING RANIKHET

Ranikhet disease, otherwise known as Doyles disease or Newcastle disease, is a deadly disease of fowls. Every year there are innumerable deaths from diseases amongst village poultry. Ranikhet disease alone accounts for nearly 70 per cent of the deaths among fowls.

The disease is known as *Manmodi* and is characterised by the symptoms of high temperature, sticky and gaping mouth, difficulty in breathing, yellowish chalky motions, lameness and paralysis of the neck and legs in some cases and death at any stage of the disease. The disease becomes such a ravage that once a village gets infected, its whole poultry population gets wiped out in a short period. Mortality is generally cent per cent.

Unfortunately, there is no curative treatment for this disease, but an efficient vaccine has now been evolved to combat it. The vaccine is a live virus cultivated on growing chick embryos. It is used only as a prophylactic measure and has no curative properties.

Trials in the field and elsewhere show that the vaccine is very effective against the disease

and confirms an active immunity for twelve months. It is, therefore, advisable to protect all poultry once every year through vaccination.

The laboratory for the manufacture of Rani-khet disease vaccine is situated at the College of Agriculture, Poona, and is manned by the Department of Veterinary Services, Bombay State. The staff of the laboratory undertakes to protect as many birds as is possible and the Assistant Disease Investigation Officer (Poultry) gives vaccinations when on tour. Veterinary Assistant Surgeons in the State also take up this work. Whenever a poultry-enthusiast requires to get his birds protected against this disease, all he has to do is to approach the nearest Veterinary Dispensary and get the vaccinations done or write to the officer-in-charge of the Laboratory or to the Assistant Disease Investigation Officer (Poultry) for doing the needful in the matter.

The vaccine is a live virus and gives some reactions in the inoculated flock. In a few cases, say 10 per cent, there may be deaths due to severe reactions and 1 to 2 per cent may go lame. In a few cases egg-yield in laying hens may be effected for a short while, but it returns to normal within a fortnight's time. It is, of course, better to lose a few eggs than to lose the hen. The very insignificant loss caused by vaccinations should

be looked upon as an insurance premium towards the safety of the rest of the flock.

In these days of shortage of food and food products, the part that poultry plays in supplementing food by providing eggs and meat is great. Now that the important disease of poultry can be successfully tackled, it is advisable that everybody should take to poultry-farming as a hobby or as a business. Any body who owns a small piece of land should keep a few birds which will certainly help him to supplement his food and his income.

THE PROBLEM OF HATCHING EGGS

The practice of raising chicks with hens is an age-old one, and is the main practice in this country to hatch chicks. The success in securing good hatching results with a broody hen depends upon the nature of the hen. The hen should have the broody instinct well-developed and should be of such a size as to cover 12 to 16 eggs. The number of eggs to be set under a hen, however, will vary with her size and the season. In the cold season, a small number of eggs, say, 12, should be set, while in the warmer weather a large number, say, 16, can be set.

The usual practice followed is to set the eggs in a ditch in the corner of a room and cover the hen with a basket. This, it should be admitted, is not a very comfortable arrangement for the hen, which has to sit for 21 days, and as such, eggs are either abandoned many a time by her, or very poor results are obtained. The nest, on the other hand, should be made of fine, soft rice or wheat straw, hay, or leaves and placed in a basket or a shallow, round ditch on the floor of the room so that the hen will not have to jump or fly to get to it. It should be large enough to accommo-

date the hen as well as the eggs with ease. If the nest is deep, the eggs may also pile up and break.

Lice breed rapidly in hot weather, and hens badly infested with lice or mites generally leave the nests. It is advisable, therefore, to dust the hens thoroughly with Gammexane before setting them. To dust a hen, spread a paper or cloth on a table or floor, and taking her by the feet and holding her on the paper on one side, rub pinches of Gammexane well into her feathers, especially around the vent. The paper or cloth will help in collecting the Gammexane which may fall down.

The hen should be kept in a room which is secluded and quiet, slightly dark and cool and away from the poultry houses. It is best to set a hen after dark, because she is less excitable then than during the day time. Examine the nests occasionally to be sure that no eggs have been broken. In case any have broken, the shells and soiled nesting material should be removed and the rest of the eggs washed with warm water to remove any material from the broken eggs sticking on to them. Feed the hen with grains, such as jowar, bajri, wheat, maize or a mixture of these, and occasionally some green feed. Always keep grit and clean water before the hen.

At hatching time, allow the hen to sit quietly

after the nineteenth day, but make sure that she does not leave the nest soon after the first few chicks are hatched.

THE PROBLEM OF THE SUMMER EGG

Every summer, poultry farmers face the problem of deterioration of eggs produced during the summer season. Developing germs in the eggs causes them to go stale, as a result of which the farmers incur a huge loss. In India, eggs worth Rs. 5.25 crores are produced every year, and during the three months of the hot summer season, nearly 40 per cent of the eggs are estimated to go bad, bringing the loss to something like Rs. 41,24,000 a month or as much as Rs. 45,800 a day.

This loss can be reduced to a great extent if farmers take proper precautions in the methods of storing summer eggs.

There is a general belief among consumers that summer eggs are not as nutritious as winter eggs. This belief, to say the least, is erroneous. The eggs produced by hens are of the same quality and composition at all seasons of the year. However, it is a fact that eggs deteriorate quickly during the hot summer months, and that the low temperature of the winter months keeps them in a comparatively good condition.

What makes the egg go bad during summer?



COOL AND SAFE

An easy way to keep down egg-losses in summer is to keep the eggs cool in mud pots. The method is proving very popular with poultry-keepers all over Bombay State.

As everybody knows the egg has a large quantity of water in it. As much as 64 per cent of the egg-content is water. As long as this water content is maintained, the egg remains in a good condition. But if on account of the heat during the summer, or due to any other reason, the moisture content is reduced, the air-space inside the egg gets enlarged, and the contents become more alkaline in nature. As a direct result of this change inside the egg, the white and the yolk get thin and spread out, and the white is unable to hold the yolk in the centre, as a result of which it gets to one side of the egg-shell.

In a fresh egg the yolk should be seen well in the centre, which position it retains even after the egg is boiled. But if the egg were to be stale, this will be seen out of centre. A good quality egg when opened covers a small area, with a high percentage of thick white around the yolk, very little of the thin white and with the yolk round and standing well up on the white.

A poor quality egg, when opened, covers a wider area. There is little or no thick white surrounding the yolk. Instead, a large amount of the thin white, thinly spread, surrounds the yolk. The yolk in such a case will be flat and enlarged.

Most people believe that a hen cannot lay eggs without fertilisation by the cock. This im-

pression is wrong. Hens do lay eggs without fertilisation, but such eggs are infertile and for that reason, cannot hatch. The embryo of such eggs does not develop for want of the male sperm. However, infertile eggs have an advantage over fertile eggs. In fertile eggs, quality deteriorates due to the development of the embryo. But in infertile eggs the quality can remain high for a comparatively longer period of time under the same conditions of preservation and temperature. Therefore, it will be a profitable venture for the farmer to produce infertile eggs for table purposes.

Eggs can be preserved for a pretty long period like two to three weeks without prejudice to quality if a constant temperature of 55° F. is maintained in storage. Without some sort of mechanical device, however, this may not be possible for the average farmer to do. But since most of the farmers dispose of their eggs on market days once a week, these farmers need not stick to this ideal temperature for preserving eggs. Great care, however, is needed to prevent embryo germination. This can be achieved by keeping the eggs in a cool place. Embryo development begins when the temperature rises to 70° F. If the farmer can keep his eggs in a temperature below 70° F., the problem will be solved. This he can do with

the help of a simple home-made device.

Eggs should be kept in an earthenware pot. This pot should be kept half buried in a mixture of sand and earth, so as to make a sort of a platform of about 3" around it. Water should be poured over this mixture so that the eggs may be kept cool and constantly supplied with moisture. The bottom of the pot should have a layer of clean grass inside it so that eggs may not come in direct contact with the percolated water. The mouth of the pot should be covered with a thin cloth to permit movements of air and moisture. The pot should be kept in a well-ventilated part of the house and not in some corner where there is no free movement of air. This simple device will help to keep the eggs at a temperature at least 12° to 14° below that of the atmosphere.

It is a good rule to turn the eggs every alternate day, as this will prevent the yolk from sticking on to one side of the egg-shell alone and causing the shell to rupture. The yolk always has the tendency to float and be on the upper side of the egg, and if it is maintained in this position for long it will stick on to this side alone.

The following points, if observed, will be found to be of extreme help to poultry farmers in keeping eggs in good condition during the summer months.

- * Gather eggs as frequently as possible, and at least, say, once at about ten o'clock in the morning and once in the afternoon.
- * Clean dirty eggs immediately after they are gathered.
- * Cool the eggs quickly in a wire-mesh basket in a room where the temperature is 60° F. or lower.
- * Always store eggs in a cool, moist place.
- * Keep the small end of the eggs down, but not until the eggs are completely cooled.
- * Market the eggs as often in the week as possible.
- * Make an attempt to produce more infertile eggs. Cockrels have no place in the laying flock after the breeding season is over.

THE PROBLEM OF MARKETING EGGS

During 1943, a chicken and egg production scheme was launched by the Government of Bombay for the supply of table eggs to Army Hospitals and hatching eggs to the Army Poultry Farms.

Because of the outstanding poultry improvement work done and the enthusiasm for further improvement work shown by poultry-keepers in the intensive poultry-breeding zone of Pandharpur and Sangola talukas of the Sholapur District, that area was selected for launching the scheme for supplying eggs and poultry birds to the Army Hospitals and Farms.

The Army wanted eggs and chickens for food and pullets for breeding purposes.

During the first year of the working of the Scheme, about 2,000 good graded birds were supplied to the Army. But the supply had to be discontinued due to a heavy mortality among birds in transit. It was therefore decided to open Central Military Hatcheries, where chicks could be hatched and reared on a large scale and meet the demand for birds. Thus the Army began producing their own birds through hatching eggs supplied to the Hatcheries and Farms. The



A group of white Leghorn graded chicks. In the intensive poultry development area in the Sholapur District, over a thousand poultry-keepers are maintaining white Leghorn flocks. This has been responsible for increasing egg-production by 60 per cent.

A 'poultry boy' collects eggs from a village poultry-keeper in the Sholapur District. Eggs collected from the villages are sent to the Central Poultry Farm at Kirkee for despatch to consumers.



Scheme was so successful that by August 1945 the Army Farms had become self-sufficient in their requirements. Thereafter, the supply of hatching eggs was discontinued and only table eggs were continued to be supplied.

The demand for table eggs was considerable, as seen from the fact that Poona alone took 80,000 eggs a month. Because of the good quality, freshness and good size of the eggs supplied, the demand was great. However, when the Scheme came to a close in September 1946, the poultry keepers had lost their genuine customers, and were left to the tender mercies of the ring of traders, who do not value big-sized eggs.

The Scheme had, therefore, to be resumed to save the poultry-keepers, now without guaranteed customers, from losses. Attempts were made to find customers among members of the public, with partial success. Since 1947, the scheme known as the 'Egg Collecting Scheme' is being worked in this area with comparatively good results.

The Scheme is worked with the main objects of improving the local stock of village poultry with a view to securing an increased supply of graded eggs and birds, supplying fresh quality eggs to Bombay and Poona through the Government Central Poultry Farm at Kirkee, marketing

of superior quality eggs produced on a large scale in concentrated poultry zones of the rural areas, supplying pure and graded cocks to villages near and far for poultry development work, arranging for a better market for the sale of pure-bred and graded stock belonging to registered poultry-keepers, giving advice on poultry sanitation, better management, housing and feeding, etc. and organising poultry shows and rallies.

Prior to the outbreak of World War II, poultry development work in Bombay State was rather feeble. This may be attributed to several causes such as poor foundation stock, lack of proper knowledge in methods of production, prevalence of poultry diseases, lack of demand for poultry products and the low purchasing power of the people. The War, however, which created a great demand for poultry and poultry products, ushered in a new era of poultry development in the State.

Government poultry development work in the villages is carried on mainly by introducing pure-bred cockrels for grading up the village poultry flocks. Continuous propaganda in this respect is being done in the villages and farmers and poultry-keepers are enlisted as registered poultry-keepers under the Scheme. Country cocks are removed from the flocks of the registered

poultry-keepers, who are then supplied with pure-bred cocks, by which rapid improvement and grading of flocks are made possible. Pure and graded hatching eggs are distributed among them at concessional rates to help raise new stock which will also ensure further supplies of best birds and eggs. These efforts resulted in a regular supply of grade 'B' eggs to the Army hatcheries during the War.

Considerable progress in the improvement of village flocks has been achieved as a result of the Scheme. The size and the laying capacity of the graded stock have increased in a number of villages where the Scheme has been worked, and the number of such villages taking to poultry farming is also on the increase. The progress made during the last seven years is as follows :

	Grades		
	A	B	C
Percentage of grades before 1943	10	30	60
Percentage of grades after 7 years	30	50	20

The Eggs Collecting Scheme works in 47 villages of the Pandharpur and Sangola talukas of the Sholapur District.

A large number of poultry-keepers under the Scheme are being given poultry and housing premia. The scheme demands not only a continuous and steady production and purchase of eggs,

but also a stable market. The purchases are always made in cash as the egg merchants also pay cash down, and even make advance payments to poultry-keepers.

There are three egg-collecting centres in the Sholapur District, situated at Pandharpur, Sangola and Javla. Poultry boys or egg-collectors (appointed by the Government) at each centre collect eggs from producers. Registered poultry-keepers cannot visit the centres more often than once a week, as the number of eggs they bring with them does not call for more visits. As such the poultry boys go to the vasties or wadis of the producers twice or thrice a week according to necessity, collect and despatch the eggs to the Central Poultry Farm at Kirkee so as to reach there on certain fixed days. Arrangements are also made to see that the quality and freshness of the eggs despatched are not impaired in any way.

Villagers are encouraged to produce better eggs by paying them premium prices, which are higher than the prevailing bazaar rates for such eggs. If the bazaar rate happens to be ten eggs per rupee, for example, then eggs are purchased at nine a rupee from these producers.

Eggs received from registered poultry-keepers are cleaned and sorted (graded) at the centres, packed and booked to the Government Central

Poultry Farm at Kirkee, which sells them direct to consumers.

The cleaning is done carefully by rubbing the eggs with a moist cloth. With some practice, a man can clean from 700 to 1,000 eggs per hour. Egg-cleaning machines are used for this purpose in foreign countries, and a few such machines have been tried in India also. An efficient hand-operated machine can clean and dry about a 1,000 eggs per hour and is recommended to dealers who handle more than 5,000 eggs per day.

After the sound, uncracked eggs are cleaned and examined for freshness, they are ready for being sorted into different grades. Grading is done according to the weight of the eggs. The grades and the minimum weights prescribed are as follows :

Grade	Minimum weight
Special	1 $\frac{1}{2}$ oz.
A	1 $\frac{3}{4}$ oz.
B	1 $\frac{1}{2}$ oz.
C	Less than 1 $\frac{1}{2}$ oz.

Grading is done with the help of a grading machine, which is operated by hand and turns out 2,000 to 3,000 eggs per hour. Machine grading is done on the basis of the weights indicated above, but since the size and weight are interrelated, it

is possible to grade without mechanical help by relying on individual judgement. A small egg-weighing scale or balance can be used for this purpose. After grading, the name of the centre of collection is stamped on the eggs.

Within twenty-four hours of cleaning and grading, the eggs are packed in *matka* type bamboo baskets. Proper and careful packing in such baskets ensures convenient handling and reduces the percentage of breakages during transit. The packing material used in hot weather is moist rice straw arranged in suitable layers to hold the eggs in position, keep them cool and prevent their shifting over. In packing eggs, the small ends are kept down, because this way they carry better in transit. In one basket about 250 to 300 eggs can be packed, and the breakages are found to be negligible, being about five per cent.

In the beginning, in spite of all care in packing and quick despatch, several other difficulties were confronted, almost all of which were surmounted, except the delay in transshipment at the Kurduwadi Railway Station and theft during transit. Theft has now been minimised by putting a layer of thorns in the packing.

It is found that the egg supplies are greater during the cold season. The highest supply is during December-January, and the lowest in

April-May. A large number of eggs have so far been supplied to the Government Central Poultry Farm and also direct to other customers during the several years of the working of the scheme.

Year	Total No. of eggs supplied to Government Central Poultry Farm, Kirkee	Total No. of eggs supplied for hatching
'43-44	—	—
'44-45	1,24,479	—
'45-46	8,42,738	1,802
'46-47	4,53,271	1,552
'47-48	1,34,202	2,052
'48-49	60,350	3,535
'49-50	14,527	4,482

Egg-marketing during hot weather has been experiencing a great handicap on account of the deterioration in the quality of eggs. The village poultryman runs his hens with the males, with the result that fertile eggs are produced which cannot be kept sound for more than a few days because of the development of embryo in them. This is all the more so during the hot weather. Experiments to find out the most practicable method of preserving eggs during the hot season under village conditions are being conducted since the inception of the Scheme. These experiments so far have shown that under village conditions, shell eggs can be preserved in earthen *matkas*. Eggs preserved this way remain in good

condition for about 8 to 10 days. This method is recommended for adoption by all poultrymen so that eggs may be preserved without fear of deterioration, especially during the summer months.

The Egg Collecting Scheme at Pandharpur has been of great benefit to poultry-keepers. They get better prices for their superior eggs, which the ordinary dealer would have denied them. They have the necessary incentive to improve their flocks under the guidance of the State Agricultural Department. The area has, therefore, developed into an important source of supply of pure-bred cocks and hatching eggs to farmers all over the State.

