Poultry Farming

Principles of Poultry Breeding:

Poultry breeding is done by a wide range of people for diverse end uses and purposes. Poultry breeding can be divided into three main areas which include:

- **Commercial** breeding
  - For egg production, or
  - Meat production
- **Village/Backyard** breeding
  - Poultry bred for both eggs and meat on a small scale
- **Fancy/Exhibition** breeding
  - Non commercial production of small poultry breeds by enthusiasts,

Commercial breeding

Chicken is by far the most popular poultry species utilised by Australians for both meat and egg production. Breeding for the commercial poultry sector is on a large industrial scale and hatcheries supply both the broiler and layer industries. In Australia, the term "broiler" or "meat chicken" is used by the industry to describe a chicken grown for meat, while the term "layer" is used for chickens grown and maintained for egg production. Chickens are also affectionately referred to as "chooks". Other poultry species such as Turkeys, Ducks & Geese, and game birds such as Quails are also produced in Australia for meat. Emus and Ostriches are also bred for commercial purposes.

More details about **Commercial poultry breeding** and the **Breeder farm sequence** can be found below.

Village/Backyard breeding

Many farmers and some suburban householders still like to keep their own poultry for egg and meat production. Most of them buy commercial crossbred hens at the point of lay and keep them in semi-intensive conditions in the yard. Some use small colony cages or even use a few layer cages in a protected spot. Others buy day-old chicks and rear their own birds.

Fancy/Exhibition breeding

There are many breeds of poultry which play very little part in the commercial poultry industry. These are called fancy poultry and are usually kept by small producers (or fanciers) who enjoy breeding, showing and exchanging birds with other fanciers.

Breeder Farm sequence

The **breeder farm** produces fertile eggs that will be hatched in a hatchery.

Brooding

Male and female chicks are usually reared separately until about 4-5 weeks of age. They are then reared so that they can work out who is boss (adjust the peck order), which means they will be less likely to fight with one another later on.

Growing

The growing period for layer breeders is from five to 20 weeks of age and is about four weeks less than for meat breeders. During the growing period, feed is restricted to avoid over consumption and, for layer breeders, to improve egg production. It is even more important for meat breeders because they become too fat to breed efficiently if on full feed. Restricted feeding begins at about six weeks of age and continues until birds have commenced laying. When birds are at 5-10% egg production, a breeder ration is supplied. Birds that have been grown on restricted feed are often called 'control fed'.

Housing

Chickens reared for breeding purpose are usually raised on litter floors similar to those used for meat chickens. They are transferred to specially designed breeder sheds, also with litter floors, at approximately 18-22 weeks of age. The sheds are usually divided into small sections which are suitable for about 200 hens to minimise fighting. Nests are placed in the shed, usually in the centre, so that the hens are attracted to the dark areas of the nest to lay their eggs.

Mating

Cockerels will mate with a number of hens and about 10% of cockerels to a group of hens is enough to achieve excellent fertility rates. A surplus of cockerels (15%) is placed at first and they are culled down to 11% at maturity to allow a loss of 1% over their lives. Cockerels can be fed a cheaper diet than hens and it's a common practice to have additional cockerel feeders placed at a greater height than feeders containing hen feed.

Collection

Fertile eggs are collected as soon as possible after laying for reasons of hygiene (if the eggs are left in the nests for longer time they are more likely to have manure spread on them or be damaged). Regular collection also protects the eggs from the heat of the day. Although it is best not to clean eggs at all, eggs can be cleaned when collected by wiping with a dry cloth or steel wool. Wet cleaning is undesirable as it removes the protective cuticle from the shell. Fumigation by formaldehyde gas is carried out as soon as possible after collection, usually at the farm or sometimes at the hatchery, to kill surface bacteria without damaging the egg.

Incubation and hatching

Eggs are set in trays marked with the shed of origin so that any problems can be traced back to the source. Hatching performance is also closely monitored and the end product is a healthy chick which goes on to become a commercial layer or meat chicken.

Commercial poultry breeding

The poultry industry **breeds chickens** destined for both commercial egg and meat production. Geneticists design special breeding programs to select birds with the best characteristics for egg or meat production. This selection process (called genetic selection or genetics) allows the industry to select strains of birds which are produced very efficiently in

intensive housing systems. There are two main types of commercial chicken breeds: layers and meat (broiler) chickens.

Forming an egg

The hen releases a yolk with the egg cell in it from her ovary where it moves into the oviduct (egg production tube). When a cockerel and a hen are mated, the sperm cells from the cockerel fertilise the egg cell at the top of the oviduct (fertilisation is the joining of the female egg cell with the male sperm cell). The fertilised egg yolk then takes 23-26 hours to pass down the oviduct, during which time layers of egg white (albumen) are laid down. Two layers of egg membranes are then overlaid, and finally the egg shell. If an egg is not fertilised, it still goes through the same process in the oviduct but it will not develop into a chick.

The egg

Although the surface of the egg is covered with bacteria, it has its own protective mechanisms in place to prevent the bacteria spoiling the egg. These are:

- The egg cools off after it is laid and bacteria are less able to grow at lower temperatures.
- The shell is coated with a fine moist layer called the cuticle, which dries and protects the egg contents from invading bacteria. This also gives a pleasing appearance, or bloom, to the fresh egg.

Most eggs are laid in the morning. Eggs are collected as soon as possible after laying and placed in a cool room to help preserve their internal quality. Fertile eggs can be stored for up to 7 days at about 12-15^{o}C without loss of hatchability. Because of the danger of bacteria on egg shells going to the hatchery, all fertile eggs are fumigated on the farm or as soon as they arrive at the hatchery. Fumigation with the gas formaldehyde kills surface bacteria without damaging the fertilised ovum inside the egg.

Hatchery

The hatchery is a special building with controlled ventilation. It contains machines for holding and incubating large number of eggs. The hatchery is designed with hygiene in mind and is laid out so that there is little chance of any contaminating organisms travelling back from hatched chicks to eggs brought in later.

Stages of incubation

- First Stage of Incubation

The first stage lasts for 18 days and is called “setting”. During setting, the eggs are placed on special trays which can be tilted through 90 degrees, from side to side. The temperature and humidity of the air in the setter is controlled so that conditions inside each egg are suitable for the growth and development of the chick.

- Second Stage of Incubation

On the 18th day, eggs are transferred to a different tray, which cannot be tilted, and placed in another machine called a “hatcher”. Eggs are transferred to hatchers so that hatching chicks do not contaminate other batches of eggs being incubated. The hatchers can then be thoroughly cleaned after every hatch. By the end of the 21st day all chicks have hatched and

are ready to be removed from the machine. They are taken to a special room and removed from the hatcher tray. They are then placed in chick boxes (usually up to 100 in a box) ready for delivery to a farm.

Candling of eggs

Candling of eggs is done after 5-8 days of incubation to examine for the presence of any infertile eggs. It is the easiest way to check on the development of the chicks inside the eggs.

Chick sexing

Sexing allows separation of male and female chicks. This can be done by:

- Visual examination, (called vent sexing) either by checking the structures in the chick's vent with the naked eye or by inspecting the internal sexual organs with a special lamp.
- Most breeds can now be sexed by checking the feather colour or the degree of growth of wing feathers. Genetic selection has been carried out to ensure that these differences between sexes are distinctive.

Layer chicks are always sexed, as the females are kept while the males are killed. Breeders are usually sexed, as a greater number of females to males are kept for breeding purposes. Meat chickens are normally left unsexed, as both sexes are usually reared together.

Other procedures

Day old chicks

Some vaccines can be administered in the hatchery. In meat chickens, all the required vaccines are administered in the hatchery before delivery to a farm. Beak trimming is sometimes carried out and in some breeds, the comb of the cockerels is trimmed (called dubbing). These procedures may seem cruel but they are carried out to prevent further injury later in life. Beak trimming is done in layer chicks to prevent pecking other birds, or cannibalism. Dubbing is done to prevent injuries to the comb which can result from fighting.

Chick requirements

The baby chick must be kept warm as it does not have the ability to maintain a constant body temperature. The chicks are transported in chick boxes which are designed to conserve heat while allowing air movement. The room where chicks are held in the hatchery and the truck which delivers them to the farm are also designed to keep the chicks both warm (32-34^{o}C) and ventilated. There is enough food and water in the yolk to keep the chicks alive for about three days, but best results are obtained if they can eat and drink as soon as possible. When placed on the farm, they must be kept warm and have feed and water available at all times.

Management of Breeding stock and Broilers:

Health, hygiene and good management of the farm as well as the breeding stock is essential the best performance of the business.

1.Chickstart

Start on house preparation well before the birds arrive on site, paying particular attention to the brooding period which is critical to give the birds the best possible chance of maximising performance. The first 14 days of a chick's life sets the precedent for good performance. Stocking density should take into consideration environmental or local climatic conditions. Remember males will be significantly heavier than the females and should be given extra floor space to help ensure they achieve target body weight. A stringent disinfection program should be in place which is regularly monitored and reviewed. Pre-heating of the house is essential, ensuring adequate time to achieve the correct house temperature, ideally 30 – 31 (C with a minimum floor temperature of 28 (C. Check the chicks two hours after the placement to ensure they are comfortable with their environment. On arrival the chicks should have good access to fresh feed and water, using supplementary drinkers for the first seven days.

2.16 to 24 week management

This is a critical period for ensuring that the birds have a high degree of uniformity, and are the adequate weight and in the right condition, for transfer to the production site. Female parents should achieve sufficient bodyweight gain between 16 and 20 weeks of age to maximise peak egg production and maintain post peak persistency. The rearing farm will have achieved its objective if it has provided the highest quality birds for the production farm.

Broiler breeder hens come into lay in response to increases in the day length when made at the appropriate time. The response of the hens to light stimulation is based on their condition, body weight and age. Accurate weighing, good observation and handling is essential to determine when a bird is ready to respond to day light increases. Delay light stimulation if the flock still contains significant numbers of underweight birds.

3.MaleManagement

It's important to remember males make up 50 percent of the flock in achieving the maximum number of fertile hatching eggs. Firstly, ensure that farm managers are well trained and have sound knowledge of what makes up a quality male and how to achieve this. The objective is to produce and maintain quality males to ensure the highest levels of fertility throughout the flock. It's essential to keep the feed and body weight continually increasing but well under control.

A quality male will have an upright body shape, be active and alert, show good color in their combs and vents, and not have too much or too little 'fleshing'. Males in poor condition should be removed while maintaining the correct ratio. Poor condition males will show very little colour in their combs and vents, have very little fleshing and can be observed as being 'hunched up' in their appearance. Males which are clearly overfeeding with very heavy fleshing should also be removed.

4.Post peak feeding management

Remember that the hen carries half of the genes responsible for broiler performance seen in her progeny. This means that females can become overweight, which may lead to problems with persistency of lay and fertility in the later stages of life. Therefore, be particularly

careful in feeding the flock after peak production.

The key to controlling female body weight is to have a good understanding of each individual flock so you know when to decrease feed. Periodic handling of the hens, along with weighing, is necessary to determine subtle changes in body composition, condition and body reserves of the hens as well as looking at peak production, egg mass and observing feed 'cleaning up' times.

5.EggHandling

Good practice collecting and grading eggs, egg hygiene and storage are fundamental to maximizing hatchability and chick quality which can only be achieved when the egg is held under optimum conditions between laying and incubation. Remember that a fertile hatching egg contains many living cells. Once laid, its hatching potential can at best be maintained — not improved. If mishandled, hatching potential will quickly deteriorate.

Nest boxes should be kept free from droppings, litter and broken eggs. Collect eggs at least four times daily. Be aware that egg temperatures within the nest, particularly during hot weather, may be similar to those in an incubator so regular collection is essential. Collect floor eggs regularly, more often than hatching eggs, which is especially important as the birds come into lay. Keep them separate from hatching eggs.

Focus on quality when egg grading, have a clear idea of what constitutes a good hatching egg and disregard all others, eg dirty, cracked, misshapes, etc. Eggs should be allowed to cool down gradually to the farm egg store temperature (refer to breeder company guidelines for exact temperatures) before putting them into store. Maintain the egg store at all times according to the correct temperature with relative humidity of 75%. It's key to remember that temperature fluctuations — whether on farm, during transport or at the hatchery — will cause higher embryonic mortality and poorer chick quality.To attain both genetic potential and consistent flock production, it is important that the producer or flock manager has a good management programme in place. Broiler, also known as Cornish Cross, is a type of chicken raised specifically for meat production. Produced by fast-growing breeds with low mortality, broilers can be reared successfully in standard housing conditions on readily available, custom-formulated broiler feed rations.

Cross breeds for parent stock (broiler breeders)

Consumers expect the meat from broilers to be tender and of high quality. The whole broiler production process is designed for this requirement but the same inputs are at odds with those required for egg production by broiler breeders.
The three main steps and stages in the whole broiler production process are:

- rearing and managing broiler breeders (i.e. the birds that produce eggs for hatching into broiler chicks),
- fattening of broiler chicks
- marketing and processing of finished broiler birds

The broiler producer clearly requires birds that will achieve a high body weight, with good

carcass quality, over the shortest possible period of time using the minimum amount of regular feed. In addition the producer also wants birds that possess the correct body conformation, which will feather rapidly and have a minimal mortality rate.

On the other hand, producers of broiler breeders (the producer of broiler parent stock) is essentially interested in all factors related to egg production and successful embryo development – onset, frequency and continuity of laying, number, size, weight, shape, and quality of eggs. This is because the producer is focused on producing as many chicks as possible for sale.

But parent birds would have been selected and bred for the fast growing characteristics they pass on to their offspring (i.e. the broiler chicks to be fattened into broilers). Birds that accumulate weight quickly in the first few weeks after hatching are generally overweight, when mature and egg production is inversely proportional to body weight. Consequently, broiler breeder hens lay only around 140 eggs per year compared with the 250 typically produced by hens laying eggs for human consumption.

A compromise must be built into the breeding programme. Failing this producers of broiler breeders are saddled with the double disadvantage of hens that lay less than 150 eggs per year and are difficult to manage because of rapid growth rate and heavy body weight at maturity.

Compromise is achieved by cross breeding. Simple programmes will typically use a 'table quality' strain as the male line (e.g. Cornish) and an egg producing strain (e.g. New Hampshire) for the female line. More complicated schemes yielding a better result would be 'Cornish' males and 'New Hampshire' females, crossed with the 'White Plymouth Rock' strain. Crossbred males and crossbred females from these respective crosses are then used as broiler parent stock to breed the broiler chicks.

High selection pressure for feed efficiency and feed conversion, growth and meat/carcass quality is applied in the male strain, but much less so in the female strain. And the use of crossbred females ensures a high degree of hybrid vigour with maximum levels of egg production, egg viability and hatching success.

Broiler growth and management

Selection and breeding for fast growth rates in broilers form the most important processes in the world poultry industry. Male broilers achieve rapid gain from the start, and at 6 weeks of age can weigh in at 2kg (live-weight). Female birds will tend to grow at a slower rate but this has definite marketing advantages because overall consumer demand is for broiler carcasses of various weights. It is not the amount of food consumed but the efficiency of feed utilisation and food conversion into body tissue which underpins the growth rate.

Broiler producers tend to plump for white feathered strains because they result in a 'cleaner-looking' carcass after processing. But there are instances where production management considerations outweigh this and coloured-feathered strains are preferred. Examples include broiler production in countries with high rainfall and the indigenous soil is red. In these

situations, red/brown Rhode Island Reds may be the most sensible choice. Feather cover must be good to maintain insulation and restrict heat loss from the body, as well as minimising incidence of skin blistering which ruins marketability of processed birds.

Many modern strains of broiler will produce yellow fat because they have been custom-bred for the American market. In markets where yellow fat is undesirable, producers should remove carotene and carotenoid pigments (coloured chemicals) from the ration. Similarly, factors that determine carcass quality in one country may not suit another. For instance, consumers in some countries may consider the body conformation, texture and taste of carcasses high quality by 'Western' standards to offer an unattractive and insufficiently chewy eating experience. For supermarket sales in general, breast meat should be broad and deep. Many such problems are overcome by incorporating local strains into cross breeding programmes to produce appropriate broiler parent stock.

Feeding Broiler Breeders (Parent Stock)

Producers of broiler parent stock (broiler breeders) have the sole aim of obtaining the maximum number good-quality, fertile eggs and hatched broiler chicks. Parent stock will clearly possess the fast growing traits required by broiler birds, but these parent birds gain weight too quickly and hens suffer reduced egg production. Clearly there is an obvious conflict of interests to ensure proper growth and development with maximum egg production. This problem is overcome by carefully planned feed restriction using the following guidelines:

- Producers must ensure broiler breeder birds attain their mature weight at 24 weeks of age
- Give crushed millet or maize once per day during the rearing period and increase to three times a day during the laying period. Throw cereal on to the litter. Birds scramble for the grains, exercise and burn off fat
- Reduce feed by 5 g a day, for every 50 g a bird registers over the optimum weight
- If rearing males and females separately, provide males with 30g of extra feed per day. If reared together only increase the feed by 5 g a day for each male bird.

Broiler Breeder Management

Broiler breeder production employs a system much like that used to rear laying bird chicks. Use the same vaccination programme plus administration of an avian encephalomyelitis vaccine in the drinking water when birds are 18 weeks old. Cull low-quality chicks (usually 3-5 per cent) at 6 weeks and use the same pattern of lighting offered to layer birds.

Immature broiler breeder birds eat excessively to satisfy their inherent (custom-bred) fast growth rates. As a result they grow too fast and become grossly overweight. Compensatory feed restriction techniques, including reduction in daily ration, low protein, high-fibre diet; miss a day feeding, restricting time access to feed and low lysine levels, are required to alleviate the problem.

On balance it is best to rear cockerels and hens separately at first because they have differing nutrient requirements. For instance, cockerels require higher inclusions of calcium and phosphorous. The sexes can then be mixed at 12 to 14 weeks using a ratio of 8-10 hens to one cockerel. All pullets and cockerels should be re-housed in laying quarters at the same time when 21 weeks of age. And with a lighting regime as for layers, broiler breeders should attain full egg production between 30 and 33 weeks of age.

Specific problems may arise in the tropics because the inherently heavier broiler breeders are more susceptible to heat stress than are birds from standard laying strains. For health considerations laying houses should be well away from houses where immature birds are being reared. Once vacated, houses used for rearing immature birds must be thoroughly cleaned and left for at least three weeks before introducing new chicks.

Management of Broilers:

More than 30 billion broiler chicks are produced worldwide on an annual basis. Fifteen billion of these are produced in the Americas. Due to the poultry industry's tendency towards more intensive production practices and increased automation, the *tender loving care* once afforded to chickens in grow-out has been replaced with a *mass production mentality*. As a result, newly hatched chicks are often subjected to numerous stressors in the first 24 hours after hatching. These adverse effects during the critical early hours following hatch can result in an increased percentage of early mortality. These early stressors also influence final performance, resulting in declines in final body weights, increases in feed conversions and cost per pound of meat produced. Farm personal must understand that they have become the "adoptive parents" of these chicks. Without attention to details, successful and profitable grow-out is not realized.

Biosecurity

No health, no gain. The objective of any broiler farmer is to receive the highest quality chicks possible. Sick, stressed, underweight, dehydrated, or weak chicks will not perform to their genetic potential in a densely populated broiler house. Assuming the chicks arrive to the farm in good health, it is then essential to ensure that the broiler farm has been decontaminated as much as possible. This means that the farm has been completely washed and disinfected and that a minimal downtime has been scheduled before receiving the next flock. Healthy chicks can become infected and diseased soon after arrival to a contaminated, poorly sanitized farm. Successful producers recognize that losses due to disease outbreaks are greater under conditions of poor sanitation, as compared to houses that have been thoroughly cleaned and disinfected before chick placement. Following chick placement, everyone at the farm must adhere strictly to comprehensive biosecurity practices. Most importantly, it is essential to prevent entry of unauthorized or unnecessary visitors. If a farm needs to be visited, a complete change of clothing (coverall and boots) and/or taking *real* showers before entry is strongly recommended. Care must

be exercised in visiting farms in the proper order, normally youngest to oldest. Common sense also dictates that suspect diseased farms be visited last. It is easier and less stressful for all to receive healthy chicks and keep them healthy during the production cycle. An intregal part of any biosecurity plan is to ensure that the recently hatched chicks are properly vaccinated at the hatchery. Vaccines are intended to assist chicks in developing resistance against specific diseases, not to add another stress during the initial days of life. Vaccinate only with vaccines that are needed, and administer them as recommended by the manufacturer.

The Most Crucial Part of a Chick's Life

The first 24 hours of the chick's life are the most important. The farms must be ready and inspected one day prior to the chick's arrival. Following are some of the basic parameters that must be taken into consideration before and during the first hours of the chick's life to facilitate a good start and finish.

Genetic Improvements

In the past two decades, the age of processing a 4.4 pound broiler has dropped from 60 days to less than 40 days. This means that the first week of life of a modern, fast-growing broiler now accounts for about 20% of the broiler's life, compared with 10% just 20 years ago. This rapid growth rate puts even more demands on management during the first week of life, leaving the broiler grower with less time to correct to deficiencies. The performance lost due to improper management can not be compensated for, as there is no time.

Air Quality

After biosecurity, the next most important factor is to provide good quality, warm, fresh air that is rich in oxygen for the recently hatched chicks. The chick's trachea is normally irritated from being boxed and shipped in the chick trays, often for many hours. Chicks are often also exposed to formaldehyde gas and contaminated air during hatch. It is important to ensure that air quality is optimum for the chicks on arrival and that it does not contain unacceptable levels of carbon dioxide and ammonia. Excessive amounts of these irritants can cause depression, dehydration, emaciation and eventually death. Poor ventilation may result in carbon monoxide (CO) accumulation, reaching toxic levels. Toxicity causes an irreversible condition that cannot be corrected with additional ventilation. Maintaining acceptable air quality is an art, and can be achieved by manipulating the curtains, extractors, etc. The purpose is to provide fresh air to the chicks without chilling or drafting the chicks or wasting expensive heating fuel. The broiler farm supervisors must understand how to manage the farms to provide warm, fresh air at all times, irrespective of outside conditions.

Brooding Temperature

The broilers' production cycle is short. For approximately one-half of their life, broiler chicks have an immature thermo-regulatory system that cannot regulate internal body temperature when exposed to temperatures outside a relatively small range. Thus proper brooding is critical, and optimum growth during the first days of life will be dependent on the grower. Management practices should be modified depending on the actual climatic conditions and local geography. However, without exception all chicks must be provided environmental temperatures from 88°F–92° F for the first 24 hours. Experiments conducted by the authors (Table 1) have shown that when chicks were brooded with lower than suggested temperatures, depressed growth, higher feed conversion, increased morality, and an average 40 index points decline occurred.

The cost to produce a pound of meat using suboptimal brooding temperatures was increased 1.6 cents/pound. The percent mortality for the chicks brooded under suboptimal temperatures was more than 8%, with 5% due to ascites that increased when using suboptimal brooding temperatures.

Before the chicks arrive, evaluate temperatures throughout the brooding area with a digital thermometer. Determine temperatures on litter surface and approximately 2 cm. above the litter. This is where the chicks will be placed. After placing the chicks, monitor their behavior and spread pattern to determine if the temperature and ventilation are suitable. In reality, there is no need for sophisticated equipment. Simply observing the chicks closely enables one to determine if problems exist. The farm managers need to understand and recognize the behavior of content chicks versus stressed chicks.

Water

Chicks can be withheld water and feed for 100 hours or more, receiving total nutrients from their absorbed yolk sac residue. However, this does not suggest that feed and water intake should purposely be restricted. Ideally, the chicks should be placed at the farm and provided water and feed in less than 8 hours from time of hatch. Longer delays could lead to dehydration and chick weight shrinkage. If long delays are expected, there are commercial nutritive hydrants available that can be placed in the chick boxes while they are being transported to the farm. The water quality, purity, and temperature must be checked in advance. Contaminated water can spread disease and cause diarrhea, leading to dehydration and death in younger flocks. If the chicks have been in transport for a long period, providing water for the first 3 or 4 hours, and then providing feed is suggested. In other words, it is imperative that chicks be encouraged to consume water as soon as possible. Many managers add some sort of sweetener substance, like sugar to the water (4% solution) for the first few hours of life. The sugar helps to replenish the

depleted energy in the chicks, and may stimulate the chicks to consume feed. The sweet water can also may loosen up the impacted intestine and prepare the gut linings for the incoming feed. After the addition of sugar, it is recommended to add a vitamin supplement to the water for the first three days of life, to boost the chicks' vitality. With the exception of water vaccination time, drinking water must be adequately chlorinated. The chlorine level at the drinker level should be 1PPM-nipple drinkers, 2PPM-plasson drinkers, and 3PPM-trough drinkers.

The Chick's Microclimate

The newly hatched chick's surroundings should be as close to ideal as possible. This environment should be compared with the microenvironment that is provided for recently born human babies. The area must be cozy, warm, and clean. It should be provided detailed attention 24 hours a day.

Equipment Density

Before the chicks arrive, the farm supervisor must ensure that the brooding area is completely ready and adequate for the number of chicks arriving. This includes having adequate floor space, feeder, space, drinker space, high quality and fresh litter material in the brooding area, etc. Besides being adequate in number, the proper distribution of feeders and drinkers is also critical. It makes little sense to receive high quality healthy chicks and then deprive them of feed and water due to lack of equipment like feeders and waterers.

Litter Quality

Close attention to litter conditions must be ongoing. Litter that is old, caked, wet or dusty must be replaced with high quality, fresh litter. In areas where litter cannot be changed after each broiler cycle due to costs for new litter, availability of new litter, or difficulty in disposing of used litter, the litter should be changed only where the chicks are to be brooded the first week, and other areas where litter is caked. If changing litter in the brooding area is not possible, newspapers can be placed for the first 24 hours in the brooding area. The objective is to reduce exposure of the baby chicks to high levels of contaminants for the first few hours while the immune system is still immature and the yolk stalk remnant may still be healing. Litter type, temperature, texture, and moisture content all could affect the ability of the newly hatched chick to survive and thrive in their new surroundings. Chicks can lose much of their core temperature through the skin of their legs in contact with the litter. Thus, bedding that has not been properly warmed before the chicks are placed can dramatically reduce chick survival. In places where there are cold temperatures, it is recommended to warm up the brooding area for at least 24 hours before the chicks arrive to ensure litter temperatures have also warmed. To evaluate the litter

temperatures, a thermometer can be used, or more simply, determine the chick's leg temperature by touching it against your skin.

Feed and Water

Microclimate management also includes consideration of the availability of high quality feed and water. Water should be at ambient temperature and feed particle size optimum for the chicks. A newly hatched chick is 85% water. When 10% of this water is lost, it becomes a cull chick, and when there is 20% dehydration, the chick could die. It is important to hydrate the chick adequately and promptly. This will promote feed consumption and better body weights. If water and feed are consumed in sufficient amounts and correct brooding temperature and air quality are provided, a broiler chick should be able to quadruple the post-hatch body weight by seven days of age. To monitor if chicks are consuming adequate feed, it is recommended to select chicks and palpate their crops. The crops should be quite full. If the crop feels half empty or empty, there must be something wrong in the management, and the above-discussed points must be reviewed very carefully. It is never too late to act and make corrections, but a problem must be detected before it can be corrected.

Before chicks arrive, inspect the house closely to ensure proper setup. After a poor start, there is little time to compensate for the lost growth as a chick's life is only approximately 1000 hours. Thus, every hour represents 0.10% of the chick's life. In a 24-hour period, 2.4% performance can be lost. Many producers recognize that performance lost the first day or first week will be reflected in final performance results.

Processing and Preservation of Eggs:

Processing of Eggs

Birds usually start to lay at around five months (20-21 weeks) of age and continue to lay for 12 months (52 weeks) on average, laying fewer eggs as they near the moulting period.

The typical production cycle lasts about 17 months (72 weeks) and involves three distinct phases, as follows.

· ***Phase 1: Small chicks or brooders.*** This phase lasts from 0 to 2 months (0-8 weeks) during which time small chicks are kept in facilities (brooder houses) separate from laying birds.

· ***Phase 2: Growers***. This phase lasts about 3 months, from the ninth to the twentieth week of age. Growers may be either housed separately from small chicks or continue to be reared in brooder-cum-grower houses. It is important to provide appropriate care to the growers particularly between their seventeenth and twentieth week of age as their reproductive organs develop during this period.

· ***Phase 3: Layers.*** Growers are transferred from the grower house to the layer house when they are 18 weeks old to prepare for the laying cycle. Birds typically lay for a twelve-month period starting when they are about 21 weeks old and lasting until they are about 72 weeks old.

Production planning

On average a bird produces one egg per day. Furthermore, not all birds start to lay exactly when they are 21 weeks old. Planning is therefore required for egg production to be constant so as to meet market demand. A schedule similar to the one shown in Table 2, which indicates on average satisfactory levels of production for a flock of birds, can be used.

In areas where the climate is hot and humid, commercial hybrid laying birds produce on average between 180 and 200 eggs per year. In more temperate climates birds can produce on average between 250 and 300 eggs per year. The table below illustrates a typical production schedule in a hot and humid climate. Usually at 21 weeks of age only 5 percent of the flock lay. On average a bird produces 208 eggs over a twelve-month period, which is a weekly production rate of four eggs per bird. At 21 weeks of age 20 eggs are produced (five birds produce four eggs each) and at 22 weeks 40 eggs are produced, etc.

Egg production rises rapidly and then starts to fall after 31 weeks of age. When less than 65 percent of the flock are laying eggs (71 weeks of age), it may become uneconomical to retain birds. Feed costs and sales of culled birds for meat must be considered as well as prices for eggs. In some instances when egg prices are high it may be viable to delay culling birds until only 45 percent of the flock is still laying eggs (78 weeks of age).

Clearly, egg production requires planning for costs as well as for profit generation and for meeting market demand. Planning involves not only the number of eggs laid by the flock over a period of time, but also when to hatch chicks to replace birds with diminishing laying capacity.

PRESERVATION OF EGGS

The Objective of the **preservation of eggs** to know the various strategies for safeguarding eggs. It is for improving keeping nature of this transitory nourishment thing. The best way to the preservation of eggs is elucidated below –

Methodology

There are different methodologies for the preservation of eggs, and in like manner the prerequisites are unique. So necessities are referenced while explaining the singular technique.

(A) HOME Conservation

Hoem preservation of eggs is applied for the small number of eggs. This methodology has been practicing in the countryside area. basically, people who live in the village has been domesticated small number of chicken, duck, pigeon and producing few numbers of eggs. There are some home preservation of eggs methods are-

1. Using Earthen Pot

The rule of this strategy is to keep the eggs in lower temperatures. The eggs can be kept in an earthen pot installed in soil having a sand bed, which is sprinkled with water. This technique is being utilized in the rustic zones to safeguard the eggs in a modest number for hardly any days.

2. Immersion in fluids

Different fluids like lime water, water glass and so forth are utilized to protect the eggs for a brief period.

a) Lime water strategy:

One kilogram of fast lime is taken in a pot and 1 liter of bubbling water is added to it. The blend is brought to room temperature, and 4-5 liters of cold water and 225g of basic salt (NaCl) are added to it. Subsequent to settling down the arrangement is stressed through a fabric. The eggs are submerged in this unmistakable fluid and kept for 16-18 hours. At that point, the eggs are taken out and dried at the room. Eggs can be saved for 3 a month by this strategy.

The additive impact of the lime water is somewhat because of its alkalinity. Other than this, it stores a dainty film of calcium carbonate on the eggshell prompting fixing of the pores.

b) Water glass strategy

In this technique, sodium silicate is utilized rather than lime water. Sodium silicate is otherwise called water glass, so the name of this technique is a water glass strategy. An answer is set up by dissolving 1 part of sodium silicate in 10 parts of water. The eggs are submerged in this answer for overnight. The eggs can be saved for around one month by this technique.

In this technique, a slim film of silica (sand) is stored on the eggshell prompting fixing of the pores.

c) Oil covering strategy

Mineral oil (nourishment grade, and vapid, scentless, less thick and free from fluorescent materials) is showered over the eggs or eggs are plunged in this oil, which structures a slender film on the outside of the shell prompting fixing of the pores. The eggs are to be treated as right on time as conceivable in the wake of laying to hold better inside quality.

d) The low-temperature technique (eggs in the cooler)

Barely any quantities of eggs can be saved by keeping the in cooler for few days for home utilization reason. Yet, in this strategy eggs ought not to be kept for over 10 days.

(B) Business PRESERVATION

Business PRESERVATION of eggs method is applied for a large number of commercial eggs. It is applicable for the poultry breeders and hatchery owners. It takes a huge number of investment due to intensive care of hatching eggs and marketing demands. This method discuss shortly-

1. Cold stockpiling strategy

New eggs are to be put away in this technique. Keeping period will be more if eggs are oil-covered before load in the harsh elements store. The temperature and relative dampness which is to be kept up exposed to the harsh elements store is as per the following:

For transient conservation For long haul safeguarding Temperature: 12.5 – 15.5°e (55-60°F) Temperature: – 10°C (14 ± 1°F) Relative stickiness: 70-80% Relative moistness: 80-90% Oil covered eggs can be safeguarded for 8 months when put away at 14°C and RH 90%, though for a half year in particular if eggs are not covered with oil.

2. Thermo adjustment strategy

Eggs are to be drenched in warm water at 54°C for 15 minutes or 56°C for 10 minutes or 60°C for 5 minutes. This warming procedure balances out the thick segment of egg whites which decreases the vanishing of dampness from inside pieces of eggs, and such eggs hold their crisp appearance for a longer period.

3. Pasteurization strategy

The eggs are to be drenched in warm water at 63°C for 2.5 minutes or 64°C for 1.5 – 2 minutes. This decimates the microorganisms present or.. the outside of the eggs. This procedure is known as the sanitization of eggs.