



A TRAINING GUIDE TO TRAINERS

MICRONESIA GROWS TECHNOLOGY

A Program to Facilitate Distance Learning for
Agriculture and Extension Students at the College of
Micronesia-FSM

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GLOSSARY

BANTAM

Refers to small breeds of chickens

BEARD

The elongated feathers below the beak area that created a puffy look to some birds

BEDDING/LITTER

A material used to cover the floor/ground in confined spaces

BROODER

A type of heated enclosure for raising chicks

CHICK

Newly hatched chicken

CLUTCH

A group of 12 to 15 eggs gathered for hatching

COCKEREL

Male that is under a year old

CROP

Part of the digestive system on chickens that stores food before continuing on to be fully digested

EXTERNAL PIP

During the hatching process, the chick's first small crack or hole in the shell is called the external pip

FRIZZLE

A genetically programmed ornamental feather type causing the curling of feathers

INCUBATOR

A machine that maintains the perfect temperatures to hatch an egg

LAYER FEED

A feed formulated for hens at laying age to support healthy and strong egg production

WATTLE

Flesh under the beak of a chicken that is used as a heat regulating mechanism

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GENERAL INSTRUCTION

01

INFORMATION AND INSTRUCTIONS TO THE TRAINER

This manual should be used purely as a facilitator's guide. The sessions under each module are presented with an outcome(s) to facilitate the assessment of participants' understanding and depth of knowledge at the end of each session. Following the outcomes are the topics to be covered and facilitating methodology. However, the facilitator should feel free to adapt the methodology suggested to the needs of participants. To enhance a participatory learning process, some methods of presentation and the steps to follow are therefore outlined. The manual also provides some background information on each session. The information is also meant to aid the facilitator in the preparation for the session. Like all participatory methods, the involvement of the participants in all stages of the learning process is vital. However, all users of this manual must study and research into the content of each module before the presentation. Start each sub-topic and group activity by explaining the objective and learning outcomes expected of them, and ensure they are met.

The session should be interactive, participatory, lively and interesting. Let the participants express themselves in local language, if deemed necessary, for them to understand the concepts. Encourage them to ask questions especially on concepts that they do not understand. Switch to either English or vernacular language when you find some farmers or all of them do not understand you in one of the languages.

Start the session with greetings, welcoming remarks, and introduce yourself. Ensure you have the necessary stationery, equipment, and materials for the trainees: projector, flip charts or whiteboard, whiteboard markers, marking pens, posters, and handouts. Be time conscious as you facilitate the session.

This manual is organized around aspects of Organic Agriculture, particularly raising organic chicken, it's feeding system, and building poultry house.

02

USERS OF THE MANUAL

The manual is intended to be used by facilitators in conducting training workshops across the College of Micronesia-FSM through the aid of C.R.E extension agents and agriculture major students.

03

PRESENTATION METHODOLOGY

The methods of presentation outlined in the manual are suggested as a guide to the facilitator. The facilitator is expected to use his or her judgement in selecting the appropriate method or combination of methods in presenting each session.

04

ASSESSMENT

At the end of each session, the facilitator is expected to assess/evaluate the participants' understanding and level of knowledge by using a simple question and answer session as appropriate. In some of the sessions, assessment questions are suggested as activities whilst in some, the facilitator is given a free hand in determining the kind of questions to be asked. However, all assessments must relate to the session.



PROJECT BRIEF

The Federated States of Micronesia are situated in the Pacific Island region and have a mix of traditional cultures impacted greatly by successive Spanish, German, Japanese, United Nations and United States colonizations and territorial agreements. The food systems here are in transition. Large pelagic and near shore aquatic resources are spread across thousands of kilometers and the potential for misuse is extreme. Local land-based agricultural practices are a mix of traditional and imported crop farming and husbandry. Both ocean- and land-based systems are subject to increasingly challenging results from climate change. In this context, one of the most important tools that local communities have is their knowledge. Showing how traditional knowledge integrates with modern, scientific agricultural research and practices is one of the benefits of a robust CRE program.

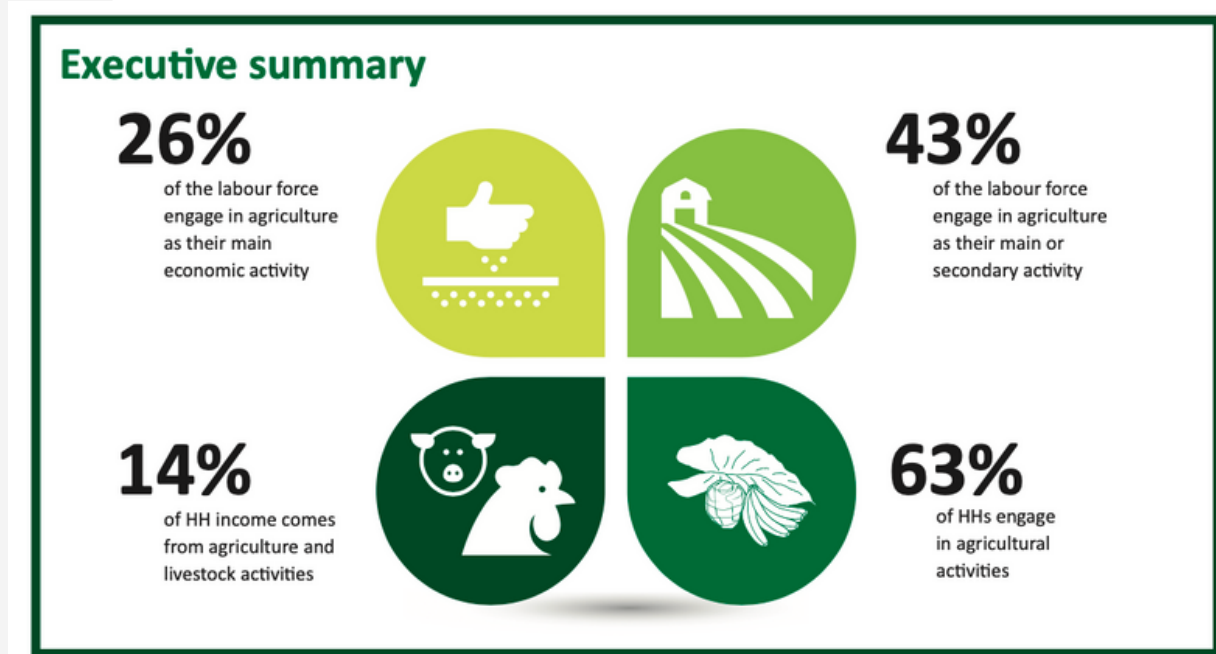
The College of Micronesia-FSM is a learner-centered institution of higher education that is committed to the success of the Federated States of Micronesia by providing academic and career & technical educational programs characterized by continuous improvement and best practices. The college is accredited by the Accrediting Commission for Community and Junior Colleges (ACCJC) of the Western Association of Schools and Colleges (WASC). Prior to the coronavirus pandemic, the college was not accredited to offer distance education programs to its students.

Distance education plays a major part in this process of integration now with the pandemic, as academic offerings of the college are exclusively online where feasible. As a result of the Micronesia Grows Technology program, well-trained agricultural workers will adopt best practices in the region, and will succeed in bringing integrated knowledge to local, state, and regional actors. Acting in concert with the college, which serves all four states of the Federated States of Micronesia (FSM), this progress will reach national communities and impact international practices as well-spoken contributions come from these former agricultural research and extension students. Affording them with personal laptop computers will make this possible in a way that faces forward and opens up access to the whole world of internet offerings in agricultural practices. Familiarity with computing helps make this happen.

The Cooperative Research and Extension (CRE) program provides training, knowledge and skill development in agriculture and aquaculture, nutrition, resource management, and youth and families through our research, extension, and resident instruction programs. The rental program providing laptops to agriculture students will add momentum to the overall goals of the college, and in particular will aid the CRE in its mission to provide unrestrained support in aiding the development of the Federated States of Micronesia.

In a Nutshell

FSM AGRICULTURE



Agriculture is extremely important for the livelihoods of households (HH) across the Federated States of Micronesia (FSM). 63% of HHs report conducting some form of agriculture and forestry. 43% of the labour force conduct agriculture as a primary or secondary activity, and agriculture contributes 14% to overall HH income.

However, most of these agricultural activities are for subsistence. Nearly 40% of HHs produce goods purely for their own consumption (subsistence). Only 24% of FSM HHs have sold any part of their agriculture production. Very few agriculturally active HHs hire labour or use inputs such as fertiliser and irrigation.

Agricultural production varies considerably across states. The most important food crops (in terms of total value sold, gifted and consumed) were: taro in Yap, breadfruit in Chuuk, yam in Pohnpei and banana in Kosrae.

Other crops also provide significant income in some states. Sakau (kava) had the highest value of production in total, and provides the highest income from sales, with more than USD2.5 million in sales in Pohnpei. Betel nut was a major income earner in Yap, and was sold, gifted and consumed across all states.

Livestock is also important for subsistence. 51% of HHs reported raising livestock but only 20% of these HHs sold their production. Pigs are the most important livestock, with 80% of livestock HHs reporting having pigs.

PRE-TEST

01

The amount of feed consumed by an individual bird per day is called:

- a. Feed b. Ratio c. Formula d. Ration

02

This poultry feed ration has the highest protein content:

- a. Starter feed b. Grower feeds
c. Finisher feeds d. Layer feeds

03

Daily routines of cleaning must include the following EXCEPT:

- a. Sorting and classifying eggs b. Collecting manure
c. Cleaning feeding and drinking equipment d. Sweeping foreign objects off

04

The following are advantages of the All-in-all-out system of broiler production, EXCEPT:

- a. Does not maximize the use of brooder/grower house b. Effective disease management
c. Can accommodate 4-5 batches per year d. Easiest to manage in terms of labor & cost

05

This is an effective method of controlling and preventing the occurrence of poultry disease:

- a. Vaccination b. Stocking density
c. Biosecurity d. Parasite control

06

These are chickens raised primarily for human consumption.

- a. Meat Type b. Layer type c. Gamefowl d. Ornamental

07

The following are characteristics of good quality chicks EXCEPT:

- a. Alert and bright eyes b. Well healed navel
c. No physical deformities d. Reddish, large and shiny comb

08

This is the fleshy, usually red, crown on top of a chicken's head.

- a. Comb b. Wattles c. Fluff d. Ear Lobe

09

Chicken house or structure intended for raising meat-type chickens

- a. Brooding House b. Grower House c. Broiler House d. Layer House

10

The following are factors to be considered in setting up a chicken house, EXCEPT:

- a. Temperature and Ventilation b. Floor space
c. Accessibility to transportation d. Protection from predators

11

This is a management practice where chicks are given extra heat and proper care and management.

- a. Feeding b. Brooding c. Debeaking d. Breeding

12

Brooding temperature is too low when:

- a. Chicks pile on top of the other near the source of heat.
b. Chicks spread themselves evenly in the brooder.
c. Chicks drink more than they can take.
d. Chicks open their wings & chirp.

13

The following are essential qualities of a good broiler, EXCEPT:

- a. Rapid growth & quick feathering b. Efficiency in feed utilization
c. Low mortality d. Hatchability

14

Which of the following is not a sign of a good layer?

- a. The head is moderately fine with large bold eyes.
b. Combs & wattles are enlarged & reddened.
c. Pelvic bones are thin, pliable & the distance is wide.
d. Vent is hard, round, dry & puckered.

15

The following are essential nutrients needed by chickens to support life processes, EXCEPT:

- a. Protein b. Carbohydrates c. Water d. Bacteria



MODULE 3

**RAISING ORGANIC
CHICKENS**



OBJECTIVES

AT THE END OF THE MODULE, YOU SHOULD BE ABLE TO:

- Identify the external parts of a chicken;
- Classify chickens based on origin, breed, and utilization;
- Describe the life cycle of a chicken;
- Recognize qualities of healthy chicks and pullets;
- Describe the types of poultry houses;
- Explain the requirements for a chicken's housing;
- Describe the features of an ideal broiler or layer house.



Topic 1 Selecting Healthy Stocks

All poultry production begins with the selection and purchasing of chicks, also referred to as stocks. This one-time decision during a production cycle, can ultimately decide the fate of your operations. You must begin with a healthy batch of chicks.

Classifications of Chicken

Based on Origin/Class

In this classification, chickens are grouped based on their place of origin. This is useful to know when looking for breeds that can grow and adapt in your preferred location.



American Class

Breeds developed in the American continent. Examples: Rhode Island Red, Plymouth Rock, New Hampshire, Lancaster, Wyandottes



Mediterranean Class

Breeds developed in the Mediterranean region. Examples: Minorcas, Leghorn, Anconas



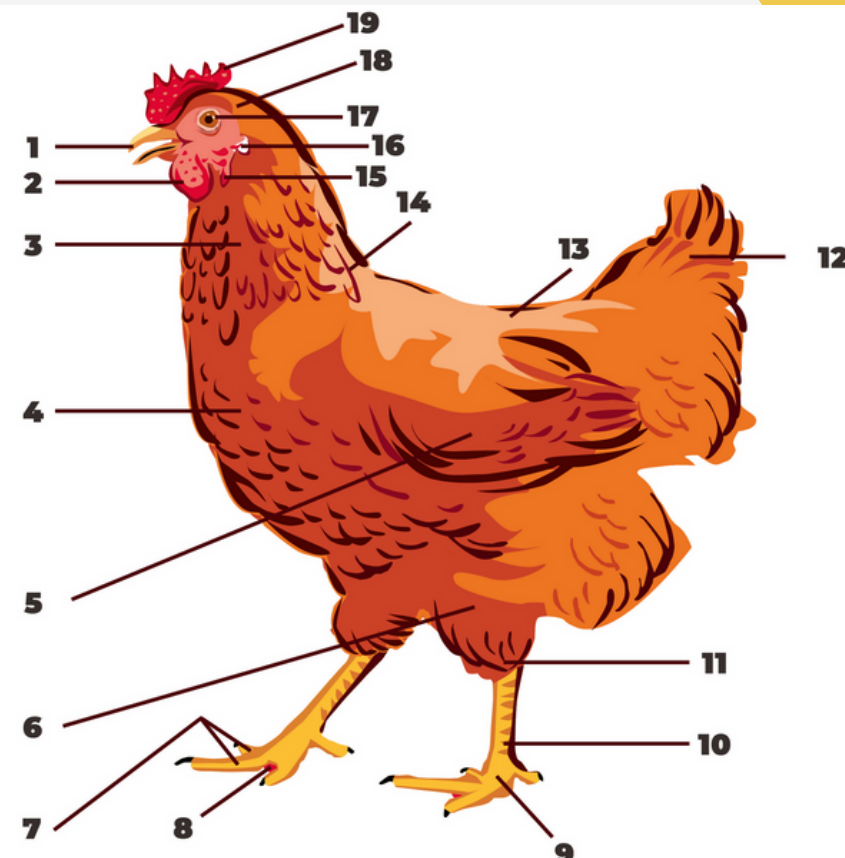
Asiatic Class

Those developed in Asia. Examples: Brahma, Cochin, Langshan, Nagoya, Cantonese,



Philippine Native Chickens

There are at least seven strains of pure native chickens in the Philippines.



EXTERNAL PARTS OF A CHICKEN

- | | |
|------------|---------------|
| 1 - Beak | 11 - Hock |
| 2 - Wattle | 12 - Tail |
| 3 - Neck | 13 - Back |
| 4 - Breast | 14 - Cape |
| 5 - Wing | 15 - Ear Lobe |
| 6 - Thigh | 16 - Ear |
| 7 - Toes | 17 - Eye |
| 8 - Webb | 18 - Head |
| 9 - Foot | 19 - Comb |
| 10 - Shank | |

Classifications of Chicken

Based on Breed

Chicken can be also classified based on **shared physical properties that distinguishes them from other chickens**. Some examples of famous breeds:



Plymouth Rock
moderate size; long and broad back; black and white speckled; full breast



Orpington
heavy, broad body with low stance; short back and U-shaped underline; fluffed out smooth feathers



Brahma
"King of Chickens;" huge, red eyes; pea comb; fluffy feathering; feathered legs



Rhode Island Red
dark red in color; long and broad back; red-orange eyes; reddish-brown beak.



Leghorn
red wattle and eyes; white feathers; yellow legs; single or rose comb



Minorcas
prominent oval earlobes that are white in color; narrow bodies; large, wide feathers usually black; red comb, face, and wattles



Cornish
broad, well-muscled body; large, deep set eyes; curved beak that gives it a cruel expression



Sussex
long, broad, flat back; rectangular build; neck has black striping

Classifications of Chicken

Based on Utilization

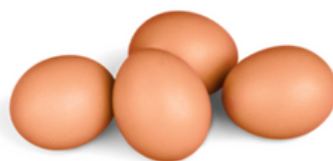
Chickens can also be **classified by their product or use**. Utilization is often associated with the breed of the chicken. Some breeds produce many eggs in a year, some breeds give good meat, while others can do both.



Meat Type

Breeds belonging to this category are raised for their meat. They are generally heavier and slower compared to laying breeds.

Example: Brahma, Cornish Langshan



Egg Type

Breeds belonging to this type are raised for their eggs. They are smaller and more active in movement.

Example: Leghorn, Minorcas



Combination Type

Breeds belonging to this type are good layers and efficient feed converters.

Example: Rhode Island Red, Plymouth Rock

Classifications of Chicken

Based on Utilization

Chickens can also be **classified by their product or use**. Utilization is often associated with the breed of the chicken. Some breeds produce many eggs in a year, some breeds give good meat, while others can do both.



Breeder

Breeder chickens are raised to be **crossed with another breed or stock possessing superior characteristics** in order to improve the genetic line.



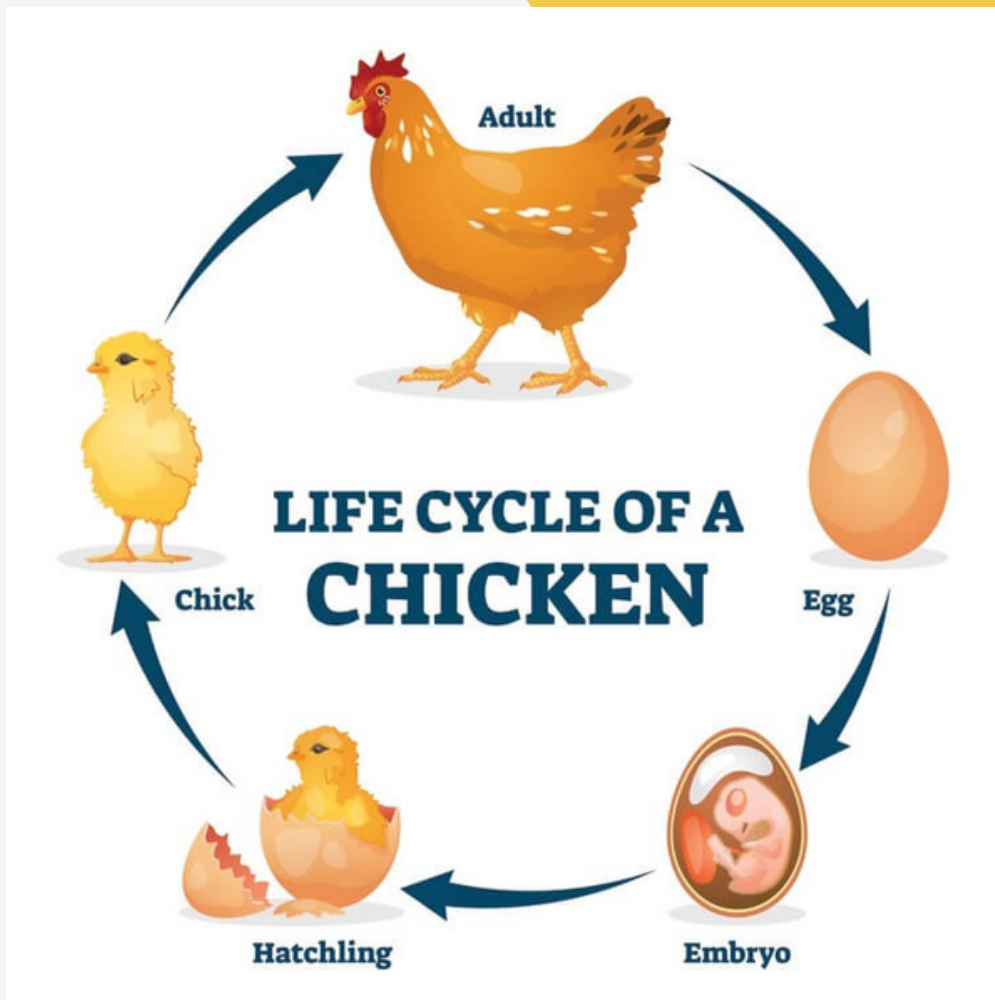
Ornamental

Breeds belonging to this type are neither raised for meat nor for egg-laying operations. They boast of beautiful physical traits and are **raised for either poultry shows and exhibits, or as pets**.



Game Fowl

Breeds belonging to this type are **raised for gaming, or sabong** in the Philippines. Roosters of this breed are active and aggressive. Not allowed in organic farming – uses antibiotics and supplements, subjects animals to torture.



CYCLE	MEANING
Adult Chicken	<p>When a pullet lays her first egg, she becomes a hen. Depending on the breed, a hen will reach its peak laying rate at a certain point. Most breeds peak at 8 months. The laying rate will then begin to decline. Hence, most farms cull and replace their layers after 1 to 2 years. Meanwhile, the cockerels will mature at 4 to 5 months but will only be called roosters when they become 1-year-olds. While transitioning, the cockerels will practice crowing and begin to act like roosters.</p>
Egg	<p>All healthy and sexually-mature hens lay eggs. The formation of the egg begins with the release of the ovum from ovary.</p>
Embryo	<p>The hen will then sit on the eggs to warm them for proper embryo development. In some cases, eggs are taken into an incubator for a more controlled setup. It takes 21 days for the embryo to develop into a chick. At this stage, the organs begin to form including the scales, beak, and feathers. The chick will absorb the yolk sac for nutrition until it hatches.</p>
Chick	<p>The hatchling is then taken under the hen's wing or transferred into a brooder equipment for safety and proper temperature settings. During this stage, it is crucial to provide proper nutrients for healthy development.</p> <p>The chicks will begin to grow real feathers on the second week. On the 5th or 6th week, the chicks will be fully-feathered and somehow capable of regulating body temperature.</p> <p>The chicks will continue to grow and acquire feathers. If the brooding facility is big enough for the growing chicks, that can serve as shelter until they reach adolescence. If it is a small brooding equipment, then the chickens must be transferred into a grower house.</p> <p>Organic chickens are raised in a free-range system so they have to be at least 30 days old before they are allowed access to outdoor spaces (PNS for Free Range Chicken, 2019). Organic poultry farmers gradually expose chicks to the outdoor environment so they can adapt to it eventually. This technique is called hardening.</p>
Adolescent	<p>At 3 to 4 months, the chicks will go through adolescence and develop sexual maturity. Most broilers will not reach this age. Additionally, only a few male chicks will be kept for reproductive purposes.</p> <p>The adolescent females are called pullets while the males are referred to as cockerels.</p> <p>Signs of Sexual Maturity in Pullets</p> <ul style="list-style-type: none"> • comb and wattles increase in size • more docile • instinctively looks for nest • enlarged cloaca <p>Pullets can be transferred to the layer house before they lay their first eggs. Roosters are not kept in layer houses.</p>

QUALITIES OF A HEALTHY STOCK

Layer Production	Broiler Production
<p>If you want to start egg production, you can begin with a day-old chick or a pullet. With pullets, you can start your egg production right away. However, day old chicks are cheaper, and you can ensure that they are raised organically.</p>	<p>With broilers, you don't really have much of a choice. You begin with day old chicks and raise them until the minimum slaughter age. Most commercial broilers are slaughtered at 4-6 weeks of age. The standards for organic agriculture does not mention slaughter age for organic chickens. However, standards for free-range chicken indicate slaughter age of 52 days for free-range broilers, and 90 days for native chickens.</p>

QUALITIES OF A HEALTHY CHICK



PARTS	QUALITIES
Eyes	alert and bright, not cloudy or dull and staring into distance
Beak	should have no deformities which will cause problems with eating and drinking
Legs & Feet	able to stand straight, no difficulty walking, no crooked toes
Navel	fully-healed, completely closed and clean, no discharge nor crust
Cloaca/Vent	clean, no droppings
Feather	clean, not disheveled
Alertness	must be active and should move fast when being approached, not sluggish

QUALITIES OF A HEALTHY PULLET



PARTS	QUALITIES
Eyes	alert and bright, not cloudy or dull and staring into distance
Beak	should have no deformities which will cause problems with eating and drinking, not panting for air, no discharge
Legs & Feet	able to stand straight, no difficulty walking, no crooked toes
Comb	deep red, not blue nor purplish nor pale
Cloaca/Vent	large, dilated, oblong, moist
Feather	even feathers, not ruffled nor missing a few feathers
Alertness	must be active and should move fast when being approached, not sluggish
Wings	must be even in size, can move freely, not droopy nor twisted
Preening	using the beak to straighten and clean feathers
Scratching	survival behavior expected of healthy pullets

Topic 2 Setting up Poultry House

Housing protects chickens from:

- inclement weathers
- predators and larger animals
- disease outbreaks, and more

Housing is largely linked to the system of rearing. The system of rearing determines the following:

- size of poultry houses
- structures that must be built
- the access/limits to pasture areas

TYPES	ADVANTAGES	DISADVANTAGES
FREE RANGE	<ul style="list-style-type: none"> • cheaper housing • unlimited foraging, less cost for formulated feeds • less stressful for chickens, normal behavior patterns • chickens are less likely to become overweight • decreased pest population • roaming chickens deposit manure directly to the soil 	<ul style="list-style-type: none"> • requires a large area • stricter standards for organic free-range • increased risk of predators • prone to parasite infestation • leaner broilers • not advisable for integrated diversified organic farms, chickens will eat crops
SEMI-CONFINEMENT	<ul style="list-style-type: none"> • access to full ration • keeps chickens from eating crops in an integrated diversified organic farm • lesser risk for predators • easier to manage 	<ul style="list-style-type: none"> • additional cost for housing materials • additional cost and labor for feeds
CONFINEMENT	<p>This system of rearing entails the complete entrapment of animals in cages or pens. It is commonly seen in commercial farms.</p>	<p>Confinement is prohibited in the rearing of organic farm animals because it restricts the access to outdoor areas and does not allow for the sufficient free movement of animals.</p>



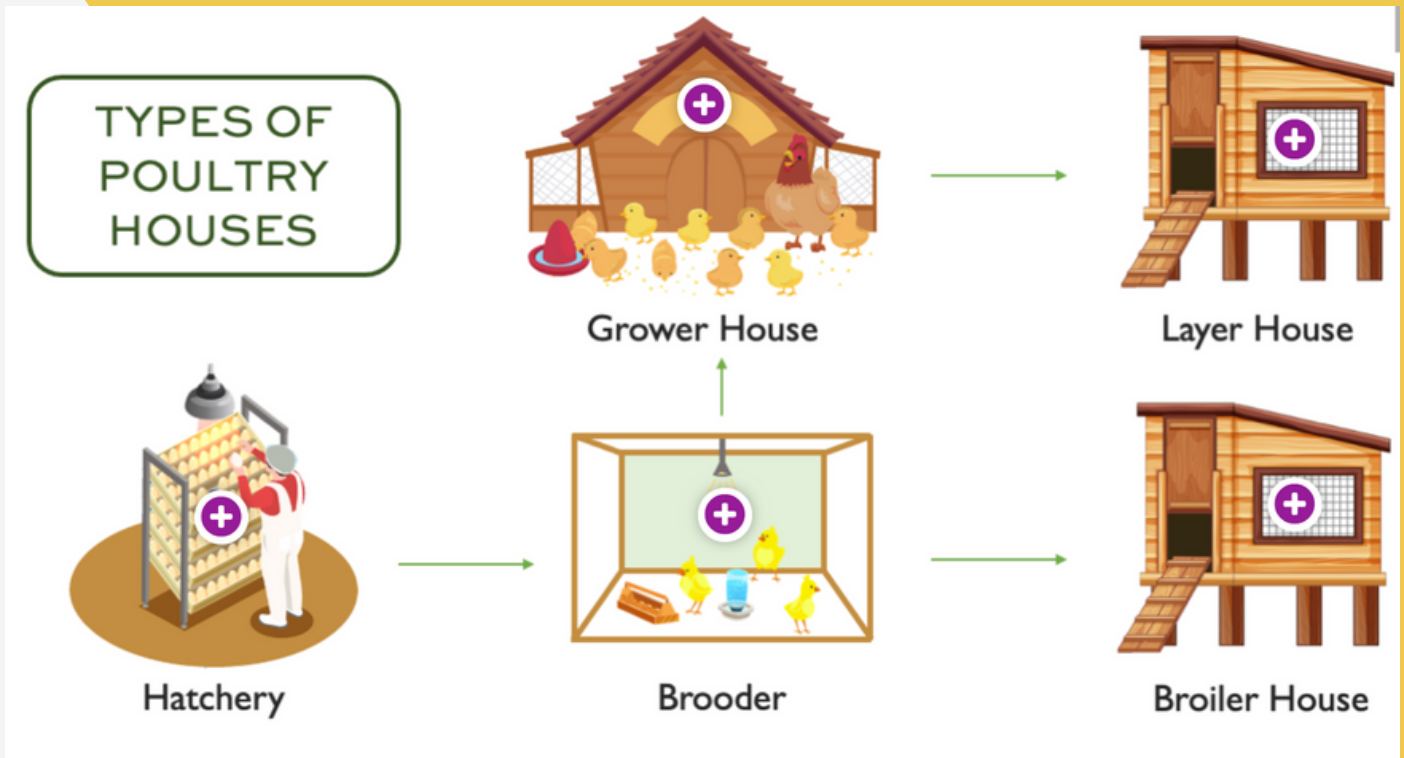
FREE RANGE



SEMI-CONFINEMENT



CONFINEMENT



TYPES	MEANING
<p>Grower House</p>	<p>This is where egg-type chicks stay when they are old enough to survive without an external heat source but are not yet ready for laying. Grower chicks are usually transferred to the grower house at 30 days old, and stay there until they are ready to lay eggs, usually at Week 18-20.</p> <p>However, if your brooding facility is big enough for your growing chicks and provides access to outdoor area, you can keep them there until they reach sexual maturity. Just add feeding and drinking equipment.</p>
<p>Layer House</p>	<p>Layers and broilers require different housing due to differences in nutritional and environmental needs. Keeping layers away from broilers is also more efficient for harvesting and culling.</p> <p>Layers are smaller but more active in movement than broilers so they generally require bigger spaces. The recommended stocking density for layer houses is 6 birds/m².</p> <p>There are also structures that are exclusive to layer houses such as roosting bars/aerial perch and nesting holes.</p>
<p>Broiler House</p>	<p>Broiler houses are structures intended for raising meat-type chickens. Unlike layer houses, broiler houses don't need roosting bars and nesting holes. Broilers are heavier and might injure themselves from attempting to climb roosting bars. Broiler houses also don't need nesting holes because female broilers are sold before they even reach laying age.</p> <p>Mobile housing can also be utilized for broilers. This is especially favorable for foraging and soil fertility.</p> <p>The recommended stocking density for fixed broiler houses is 10 birds/m² and 8 birds/m² for mobile houses.</p>

TYPES	MEANING
Brooder House	A brooder is a structure or enclosure that provides external source of heat to hatchlings while they do not yet have the ability to regulate their own temperature. A brooding equipment usually consists of an enclosure, source of heat, beddings, and feeding equipment.
Hatchery	<p>A hatchery is any facility or structure where eggs are hatched in controlled conditions. Ideally, eggs hatch when their hens sit on them. However, this puts the eggs at risk of cannibalism, abandonment, insufficient humidity and temperature.</p> <p>A mini-hatchery consists of an enclosure, heat source, egg trays, and a thermometer. The design must allow for temperature regulation, flow of air and the safety of eggs.</p>

REQUIREMENTS FOR POULTRY HOUSING

Requirements for Fixed-Building Houses

	LAYER	BROILER
Floor Space	0.17 m²/bird	0.09 m²/bird
Floor Height	0.31 m (1 ft.) above the ground	
Range/Pasture Area	0.17 m²/bird	0.09 m²/bird
Pop Holes/Exit Holes	<ul style="list-style-type: none"> - At least 2 exit holes or ladders every 10 m along one side of a house. - To give access to pasture area. - Exit holes should be 46 cm in height and 100 cm in width. 	
Dust bath	May be provided in the housing or accessible in the range/pasture area.	
Nest Hole	Each nest hole can be shared by at most 5 birds	not necessary
Roost bar/ Aerial perch	Should be at least 31 cm of space per hen; must be wide enough so that the whole feet of the hen can land on it.	not advised, may cause injury to growing broilers
Shape	Long, narrow (less than 30 ft. wide) for better ventilation and lighting	

Requirements for Mobile Housing

	LAYER	BROILER
Floor Space	6 birds/m ²	8 birds/m ²
Nest Hole	Each nest hole can be shared by at most 5 birds	not necessary
Roost bar/ Aerial perch	Should be at least 31 cm of space per hen; must be wide enough so that the whole feet of the hen can land on it.	not advised, may cause injury to growing broilers

Recommended Feeder and Water Capacity

	BROODERS (1 - 4 weeks)	LAYERS	BROILERS
Feeder Space	5 ft. of feed trough/ 100 birds 2 bucket feeders/ 100 birds	1 tube or pan feeder/15 birds in controlled feeding environment. 1 tube or pan feeder/40 birds in a free feeding environment.	1 ft. of feed line/ 10 birds 1 tube or pan feeder/ 30 birds
Water Space	1.5 round 5-gal. waterers/100 birds	1 ft. of water trough/ 15 birds 1 round waterer/ 100 birds	4 ft. of trough waterers/ 100 birds 1 tube waterer/ 100 birds

DESIGN CONSIDERATIONS IN POULTRY HOUSING

	MEANING
TEMPERATURE & VENTILATION	<p>Make sure your housing provides for proper ventilation so as not to induce heat stress in your chickens and make them vulnerable to diseases.</p> <ul style="list-style-type: none"> • Set up your house in an area in the farm where there is proper ventilation, enough exposure to sunlight, and tolerable winds. • Provide room thermometers for monitoring and electric fans or blowers for facilitating air movement. • Use housing materials that are poor heat conductors e.g. wood.
LIGHT	<p>Light influences the physiological development of chicken. Light affects egg production by stimulating the release of follicle-stimulating hormone (FSH) and luteinizing hormone (LH) for the growth of the ovum in layers. In broilers, light affects growth and metabolism. Light is essential for vision and color discrimination.</p> <ul style="list-style-type: none"> • Set up your chicken housing in an area where there is enough exposure to sunlight. • Provide exits where chickens can pass through to range freely and access light. Give broilers 8-10 hours of sunlight and 14-16 hours for broilers.
FLOOR SPACE	<p>Do not overcrowd your poultry house. Overcrowding encourages cannibalism and egg-eating habits. Provide ample size for your chickens.</p> <ul style="list-style-type: none"> • For layers, maintain a stocking density of 6 birds/m²; • for broilers in fixed houses, 10 birds/m²; • for broilers in mobile houses, 8 birds/m².
PROTECTION FROM PREDATORS	<p>Common predators of chickens include snakes, birds of prey, rodents, and cats. Rodents and cats will attack smaller chicks. Use materials that are predator-proof. Design your housing in a way that makes it impossible for predators to get through.</p>
FEEDING	<p>Consider how you plan to feed your chickens. Provide space for feeding equipment. Prevent roosting birds from pooping into feeders.</p> <p>Think about the convenience of the caretaker who will feed your chickens. As much as possible, reduce the labor in transporting the feeds from the storage to your housing. You can also provide a shed for storing feeds in the housing.</p>
CLEANLINESS	<p>This goes without saying, cleanliness will keep you and your chickens free from diseases.</p> <ul style="list-style-type: none"> • Design a good drainage system for the safe and efficient collection of manure. • Choose housing materials that are easy to disinfect.

Construction Materials



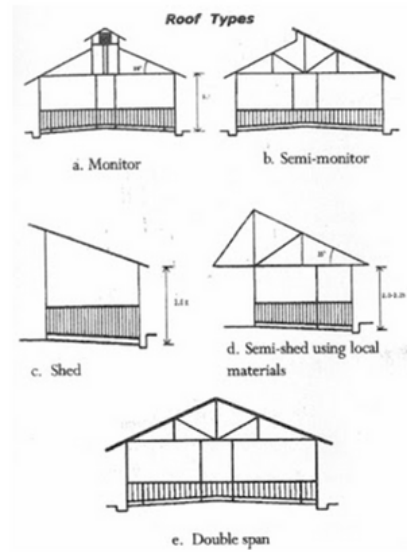
native

- can be made of bamboo, coconut trunk, cogon, nipa, etc.
- cheaper



industrial

- made of metal/iron bars, and poultry wire
- expensive



Type of Roof

Recommendations:

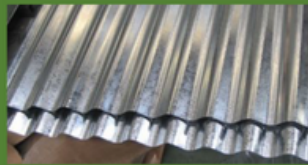
- shed** – narrow houses, 8-10 ft. wide | **gable (double span)** – medium houses, 10-24 ft. wide
- semi-monitor** – wide houses, 24-30ft. wide | **monitor** – wide houses, 24-30ft. wide

Roofing Materials



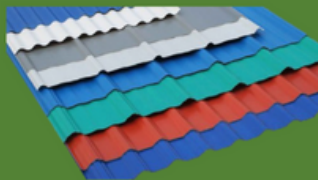
cogon or nipa

- cheap, cool, BUT not durable and is a fire hazard



galvanized iron

- durable, fire-resistant, BUT expensive and warm



metaplast PVC

- cool, quite durable, BUT expensive

Flooring Materials



slat floor

- easy to clean with water, lesser chance of fungal infection, easier manure collection



concrete floor

- durable, requires litter/bedding materials to lessen risk of parasites and spread of diseases

Bedding Materials

litter – collective term for materials used as bedding in poultry production



advantages

- helps in proper leg development
- provides surface for scratching, foraging, and dusting
- absorbs manure and other excrements
- provides warmth

examples

- rice husk or *ipa ng palay*
- hay or *dayami*
- corn fodder or *kumpay ng mais*
- peanut hulls or *balat ng mani*
- sawdust
- shredded leaves

Housing Equipment



heat lamp



incubator



feeder





waterer

Topic 3 Feeding the Chickens

Animal nutrition matters to the farm owner just as much as it matters to the animals. If your chickens are healthy, your farm becomes more productive and profitable. Your chickens are less likely to get sick and are more likely to produce healthy manure for your crops.

Animal nutrition has the biggest impact in the production of eggs and the live weight of broilers. What you feed your chickens and how you feed them will affect their behavior and their quality.

	Whole Grain	Mash Feed
Examples	wheat, oats, barley, corn, rye, sorghum, rice	starter mash, grower mash, pullet developer, finisher mash
Form		
Processing	unprocessed	grinding and mixing
Nutrients	carbohydrates	carbohydrates, protein, micro-nutrients, etc.

	Soluble Grit	Insoluble Grit
Examples	limestone, oyster shell	flint, granite
Form	 <p style="text-align: center;"> Chick Grit Chicken Grit Oyster Shells </p>	
Use	Absorbed and utilized for eggshell formation	Stored in the gizzard to aid breakdown of other feeds

Nutrients for Proper Animal Nutrition

Click on any of the nutrient components to find out what they do for your chicken's nutrition.



Proteins

Minerals

Energy

Vitamins

sample mash feed

Water

Table 1. Nutrient requirement of meat-type and egg-type chickens at different stages of growth and production.

Nutrient	Broiler Production		Egg Production			
	Starter (0-5 weeks)	Finisher (5-7 weeks)	Starter (0-6 weeks)	Grower (6-12 weeks)	Pullet developer	Layer (20-40+ weeks)
Protein (%)	20-22	18-20	20	18	14.5	18
ME (Kcal)	3000	3200	2600-2670	2850-3050	2850-3200	2950-3000
Calcium (%)	1-1.1	0.7-0.9	1-1.2	0.8-1.0	0.8-1.0	2.6-2.8
P (%)	0.45	0.40	0.40	0.35	0.45	0.45

Table 2. A typical feed formulation (all-mash).

Ingredients	Parts (kg)
Yellow corn (ground)	47.49
Soybean meal	24.56
Rice bran D ₁	10.00
Copra meal	8.00
Fish meal	6.00
Molasses	2.00
<i>Lactobacillus</i> sp.	0.20
Limestone	1.00
Salt	0.25
Vitamin/Mineral premix	0.50
Total	100.00
Calculated Nutrients	
Crude protein (%)	21
Metabolizable energy (Kcal/kg)	2,801
Calcium (%)	1.02
Phosphorus (%)	1.02

SYSTEM OF FEEDING

TYPES	ADVANTAGES	DISADVANTAGES
AD LIBITUM	<ul style="list-style-type: none"> • Allows chicken to regulate their intake • Prevents crowding and fighting during feeding • Less labor required for poultry caretaker 	<ul style="list-style-type: none"> • Not advisable for layers • Chickens might single out the feeds they don't want to eat resulting to imbalance diet • Prone to food wastage • Expensive
CHOICE FEEDING	<ul style="list-style-type: none"> • Reduces feed cost, especially feed-processing • Allows birds to regulate their diet • Studies suggest lesser intake and more efficient feed conversion 	<ul style="list-style-type: none"> • Not advisable for chicks, only for growing chickens • Chickens might ignore other nutritional needs based on palatability and lack of visual stimulation • Studies suggest lesser intake and lesser weight gain
RESTRICTED	<ul style="list-style-type: none"> • Economical • Birds will forage between meals which will benefit soil fertility • Avoids sorting or selective breeding • Allows farmer to use feeding time to move the chickens to another location 	<ul style="list-style-type: none"> • Requires more feeding equipment to prevent crowding and fighting • May prevent smaller, less aggressive chickens from eating • Extended periods without food can lead to cannibalism among growing birds

Restricted

feeding time and quantity of feeds are controlled

the caretaker moderates the feed intake
water is available throughout the day

Ad Libitum

allows access to full ration at all times

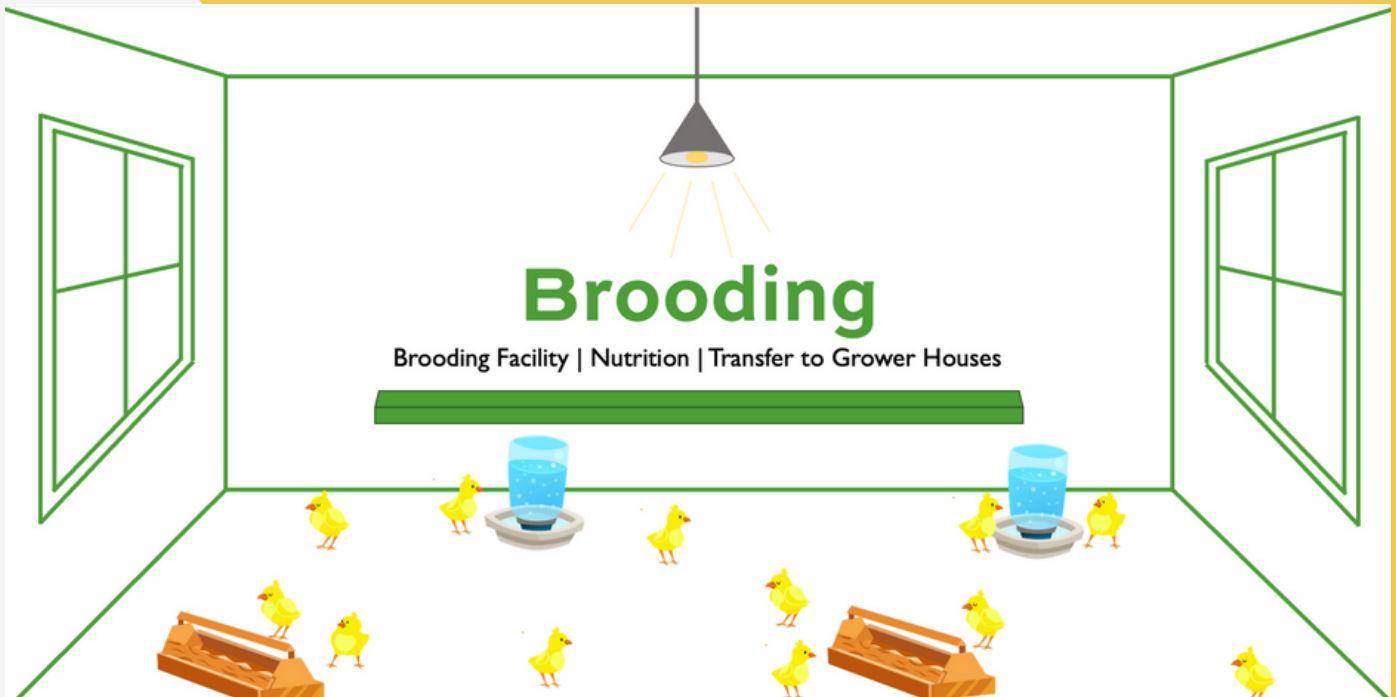
ad libitum means *at one's pleasure or as desired*
water is available throughout the day

Choice Feeding

More concerned with the amount of feed and nutritional content than the time of feeding

"buffet style;" relies on "nutritional wisdom" of chickens to choose the nutrients they need

Topic 4 Growing the Chickens



BROODING FACILITY

At the brooding stage, your chicks are like orphans in need of a **foster home**. This foster home is called a **brooder**.

When chicks hatch, they come out with **downy feathers**...These feathers, no matter how clean or pretty to look at, shed and **are slowly replaced by adult feathers**.

During this period, the **chicks cannot yet regulate their temperature** and will **need an external source of heat**. Without an external source of heat, they can die from the cold.

This crucial stage is called **brooding**, and it **lasts for approximately 4-6 weeks**. Brooding takes place in a brooding facility/equipment.



A brooder is...

...a **structure or enclosure that provides chicks with its basic needs:** food, water, shelter, and warmth.

A brooder usually consists of an enclosure, source of heat, beddings, and feeding equipment.



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Temperature

An important element for success in brooding is proper temperature. To prepare, **warm up the brooder before the chicks arrive.**

Based on the age of the chicks, **adjust the temperature in the brooding facility/equipment.**

Age of Chick in Weeks	Temperature
Week 1	32.2 – 35°C
Week 2	29.4 – 32.2°C
Week 3	26.7 – 29.4°C
Week 4 onwards	26.7°C and below

Temperature

Observe the behavior of your chickens.

If they huddle closely to the heat source, it means that they are cold. Move the heat closer.

If they move further from the source of the heat and are panting, adjust the heat source. Chicks that are satisfied with the temperature make regular noises and go about eating and walking in the brooder.



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Nutritional Requirement

Chicks at the brooding stage require a **special “starter” feed**. Their **diets must be high in protein** to support physiological developments.

Table 1. Nutrient requirement of meat-type and egg-type chickens at different stages of growth and production.

Nutrient	Broiler Production		Egg Production			
	Starter (0-5 weeks)	Finisher (5-7 weeks)	Starter (0-6 weeks)	Grower (6-12 weeks)	Pullet developer	Layer (20-40+ weeks)
Protein (%)	20-22	18-20	20	18	14.5	18
ME (Kcal)	3000	3200	2600-2670	2850-3050	2850-3200	2950-3000
Calcium (%)	1-1.1	0.7-0.9	1-1.2	0.8-1.0	0.8-1.0	2.6-2.8
P (%)	0.45	0.40	0.40	0.35	0.45	0.45

Teach Chicks to Drink and Eat



Teach chicks to drink water by dipping their beaks into the waterer.

Within 2-3 hours after they have learned to drink, give them grits and feeds in mash form.

Make sure food and water are available at all times.

Health and Sanitation



Clean the waterer on a daily basis. Every few days, **clear out the feeding equipment** and supply with fresh feeds.



To **help your chicks build immunity** against parasites, feed them with natural acids such as apple cider vinegar.



To prepare this, add **1 tbsp. of molasses** and **1 tbsp. of apple cider vinegar** for every gallon of water.

Preparing the Chicks for Transfer

Allow **access to a protected outdoor area** as early as the 4th week.

Consider the weather:

- If it's raining, you may want to keep them in the brooder.
- If it's warm enough, you can let them out for not more than 8 hours. Make sure the outdoor area is fenced and is free from predators and bigger animals.

Slowly introduce whole grains into their diets.



Transferring the Chicks

The transfer of chicks from the brooder to the grower/broiler house depends on the operation of the farm.

- **Broiler chicks** are transferred directly from the brooder to the broiler house typically at week 3 or 4.
- **Layer chicks** are transferred to grower houses and stay there until they develop sexual maturity.



SETTING UP A BROODER

Start with the Enclosure	Install Bedding Materials	Install Heat Source	Install Feeding Equipment
<p>A brooder should, first and foremost, serve as a shelter. You can make a brooder box or a brooder house depending on the number of chicks you plan to raise in one production cycle. Each chick should have at least a square foot of space in the brooder. Build “walls” that are at least 36 inches high to keep growing chicks from hopping out. The enclosure can be made from wood, thick cardboard, or a repurposed plastic tub. You can also incorporate hardware cloth in the walls for proper ventilation.</p>	<p>Bedding Materials:</p> <ul style="list-style-type: none"> • rice hulls • non-treated sawdust • newspaper • sand <p>Layer at least 3 to 4 inches of litter on the floor of the enclosure. Replace the litter at least once a week or more frequently depending on the number of chicks.</p>	<p>Sources of Heat for Brooders:</p> <ul style="list-style-type: none"> • incandescent bulb – uses electricity, bright light makes it hard for chicks to sleep • infrared bulb – uses electricity, makes it easier for chicks to sleep • kerosene lamp – uses fuel • charcoal – placed inside a clay pot and lit, no light <p>Place the source of heat at one end of the brooder. If you’re using light bulbs, you can screw them onto the ceiling/lid or have them suspended onto a clamp. Use a thermometer to measure the temperature of the bottom of the brooder.</p>	<p>Set up a feeding and drinking station at the other end of the brooder. Make sure the size of the equipment matches the size of the chicks. Make feed and water available at all times.</p>



Raising Layers

Breeds | Raising Pullets | Nutrition | Other requirements

Layers

Layers are chickens raised for their ability to lay eggs.

✗ not to be confused with breeders*

● layers produce eggs that are meant for consumption

Layers are raised in free range systems or in semi-confined systems.

Week 4-6: Transfer to Grower Houses

After brooding (4-6 weeks), the **chicks should be transferred to grower houses** with wider floor spaces and temperatures of 26.7°C and below.



one-week-old chick



brooder



six-week-old chick



grower house



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Access to Pasture and Sunlight

The chicks should be given access to pasture areas for foraging and for sunlight for **at least 6 hours** (PNS/BAFS 262:2018).

Important: Exposure to sunlight, however, must not exceed 12 hours.

Extended exposure to sunlight during this stage will lead to **early sexual maturity**.

Week 12-16: Transfer to Layer Houses

At 3-4 months, the chicks **will begin to develop sexual maturity**. Transfer them to the layer house to help them adjust to their new surroundings before laying.



Nesting Boxes (Source: The Poultry Guide, 2013)



Roosting Bar/Aerial Perch (Source: DIY Coop Builder)

Signs of Sexual Maturity in Pullets



comb and wattles increase in size



become more docile



instinctively looks for nest



enlarged cloaca

Early Sexual Maturity

Early sexual maturity produces **smaller eggs and shorter egg production cycle**.

If your chicks are showing early signs of maturity, you can **delay this with**:

- a low protein, low lysine **diet**;
- a decrease in the **amount of feed**;
- a decrease in **hours of exposure** to sunlight

Week 20-24: Increasing Light Hours

Light influences physiological development of the chicken. It affects egg production by stimulating the **release of follicle-stimulating hormone (FSH) and luteinizing hormone (LH)** for the growth of the ovum.



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At **5-6 months of age**, the chicks will have reached sexual maturity or the **pullet stage**. You can now increase the number of light hours for laying hens to 14-16 hours.



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Golden Rules

Do not increase light hours of growing chickens. If you do, this will stimulate early sexual maturity.

Do not decrease light hours of laying hens. If you do, egg production will slow down.

Layer Nutrition

Layers need **high amounts of calcium** for eggshell formation. They also need **high protein content**.

Layers generally consume somewhere between **90-140 grams of feeds per day**. Be sure to account for all layers during feeding time.

Water must be available throughout the day.

Eggs are 65% water. It is estimated that for every 100 layers, 7 gallons of water is consumed. This, however, varies due to temperature.

Table 1. Nutrient requirement of meat-type and egg-type chickens at different stages of growth and production.

Nutrient	Broiler Production		Egg Production			
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P (%)	0.45	0.40	0.40	0.35	0.45	0.45

Raising Broilers

Breeds | Raising Broilers | Nutrition | Systems of Operation



Broilers

Broilers are chickens raised for their meat. They grow fast and can reach a marketable liveweight of 1.6 to 2.0kg at 6-8 weeks.

Organic broilers can be raised in free range systems or in semi-confined systems just like their layer counterparts. But beyond this, broilers are raised quite differently.

Broilers have shorter rearing periods and nutrient requirements.

Week 4-6: Hardening Period

Just like their layer counterparts, broilers are brooded for 4-6 weeks. After which, they are **“hardened”** or allowed gradual access to pasture areas. This helps them adjust to their surroundings and increases their chances of survival.



Week 6: Transfer to Broiler House

Once hardened, the chicks are transferred to a broiler house with wider floor spaces and temperatures of **26.7°C and below**. The chicks will stay in the broiler house until they are ready for harvesting.



Broiler Nutrition

Whether you choose to feed broilers ad libitum or restricted, their diets must have **high protein and energy content**.

On average, broiler chicks will consume **1.5kg of feed from Week 1 – Week 4**. After this period, the broilers will consume about **120 – 185 grams per day until Week 8**.

Water must be provided throughout the day.

Table 1. Nutrient requirement of meat-type and egg-type chickens at different stages of growth and production.

Nutrient	Broiler Production		Egg Production			
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P (%)	0.45	0.40	0.40	0.35	0.45	0.45

Source: Organic agriculture in the Philippines: A training manual, 2012

SYSTEMS OF BROILER OPERATION

Broilers have shorter rearing periods and are ideally raised in batches. In this section, you'll learn the 3 ways you can maximize your broiler operations.

	All-in-all-out	Two-Stage	Multiple-Stage
Advantages	<ul style="list-style-type: none"> • easiest to manage in terms of labor and cost • ideal for community-supported agriculture • effective disease management • can accommodate 4-5 batches a year 	<ul style="list-style-type: none"> • efficient utilization of brooder and grower houses • more broilers, more profit • more manure for compost 	<ul style="list-style-type: none"> • efficient utilization of brooder and grower houses • maximizes profit • stable source of broilers
Disadvantages	<ul style="list-style-type: none"> • does not maximize use of brooder and grower houses • lowest profit compared to other systems 	<ul style="list-style-type: none"> • requires one brooder house and one grower house • requires more labor and cost for feeds • transferring the broiler from the brooder to the grower house can be stressful for chicks 	<ul style="list-style-type: none"> • requires more housing • requires more labor and cost for feeds • transferring the broiler from the brooder to the grower house can be stressful for chicks

HEALTH MANAGEMENT PRACTICES

Observation	<ul style="list-style-type: none"> Conduct regular check-ups of your chickens. Inspect the eyes, beaks, combs, wattles, feet and wings for any abnormalities. Look for possible wounds, injury, conditions. Observe their behavior. Monitor their weight. Weight loss can be indicative of so many conditions. Inspect their poops for parasite infection.
Parasite Control	<ul style="list-style-type: none"> Inspect the legs and the feathers for mites. Provide oriental herbs and beneficial microorganisms (e.g. lactic acid bacteria) in the diet to boost the immunity of chickens. Re-house your chickens and sanitize the coops in case of an outbreak. Provide dust baths. Manually remove parasites.
Use of Organic Concoctions and Extracts	<p>The use of organic concoctions and extracts is also helpful in boosting the immune system of farm animals, thereby preventing diseases. FAA, LABS, IMO, OHN, and EMAS are concoctions that prove to be good pro-biotic for chickens. Simply mix 10-20 mL of the concoction for every liter of non-chlorinated water.</p>
Vaccination	<p>Under national standards for organic agriculture, the use of antibiotics as a preventive measure is not allowed. However, vaccinations may be allowed if there is an endemic disease in the region where the farm is located OR if a vaccination is legally required. Also, vaccinations may only be administered under the supervision of a licensed veterinarian.</p>
Veterinary Services	<p>Chickens must be given veterinary attention when there is a threat to their health. Have a licensed veterinarian check on your animals, administer vaccinations, issue veterinary prescriptions, and more.</p>
Beak Trimming	<p>Beak trimming is the partial removal of the tip of the beak. It is usually done to prevent injuries resulting from severe pecking. It is also done to birds with deformities in their beaks.</p>
Caponization	<p>Caponization is the removal of testicles in adolescent male chickens. This procedure makes male chickens less aggressive and more docile which allows it to live peacefully with other chickens. Castrated males or capons also reportedly produce better-tasting meat.</p>

CLEANING & SANITIZING THE HOUSE

Collecting Manure	Cleaning and Sanitizing
<ul style="list-style-type: none"> • An important part in cleaning and sanitizing your chickens' houses is the management of manure. • Animal manure may seem unpleasant to some people but it is actually a good source of organic matter for the soil. You can utilize chicken poop in the cultivation of your crops by collecting it from your coop/shed and then adding it to your compost. Note that animal manure should not be directly sprinkled over crops in the farm. It must undergo proper decomposition. • If you're using a deep litter, you can collect the deep litter during cleaning schedules. • You can also place manure boxes under roosting perches/bar. Chickens like to poop while they're sleeping. Collect them every morning so that the mosquitoes won't thrive in them. 	<p>Daily routines of cleaning should include:</p> <ul style="list-style-type: none"> • collecting manure • cleaning feeding and drinking equipment • sweeping foreign objects off the poultry house or the pasture area <p>After each production cycle, do a general cleaning of the poultry house.</p> <p>Dry Cleaning</p> <ol style="list-style-type: none"> 1. Remove contents of feeders and waterers. 2. Sweep off loose dirt from the floor, walls, ceilings, fixtures, nest boxes, roosting bars. 3. Collect deep litter for your compost. <p>Wet Cleaning</p> <ol style="list-style-type: none"> 1. Soak heavily-soiled areas in water. This will make it easier for you to scrape accumulated dirt off roosting bars and floors. 2. Wash every fixture and area in the building with a cleaning solution. Scrub with a cleaning brush to remove dirt and manure from surfaces. 3. Rinse the area with water to flush out residues and remaining dirt. <p>Drying</p> <ol style="list-style-type: none"> 1. Open all windows and doors to allow air-drying. 2. Mop up puddles of water to prevent bacteria from breeding. <p>Repairs</p> <ol style="list-style-type: none"> 1. Inspect the building for any area that might need a repair. 2. Seal rodent holes with spray foam and steel wool. <p>Disinfecting</p> <ol style="list-style-type: none"> 1. Dilute 2 tbsp. EMAS (household bleach) per 1 L of water. 2. Soak waterers and feeders in the disinfecting solution. 3. Using a knapsack sprayer, spray the solution onto the surfaces of the building.

Topic 5 Harvesting the Chickens

Harvesting Eggs

Egg Collection

Once a pullet begins laying, she is expected to lay **one egg a day**. Some hens will skip some days in the egg production since egg formation takes 25-26 hours. Hens normally lay their eggs in the morning, but you can expect some hens to lay in the afternoon.

Collect eggs every day.

- ✓ prevent your hens from being broody
- ✓ decreases exposure to dust, dirt, and chicken poop
- ✓ lessens risk of injuries – cracks and egg-eating
- ✓ eggs will remain fresh when stored right away



Cleaning

Eggs are exposed to dust, dirt, and chicken poop prior collection. Clean eggs right after collecting.

To clean eggs:

1. Check for soil or poop. Gently remove with sandpaper or loofah.
2. Wash the eggs one at a time under running water.
3. Dry eggs with paper towels, or a clean cloth.
4. Sanitize eggs by spraying with EMAS solution of 10mL per liter of water.
5. Allow eggs to air-dry before placing them in containers.



Egg Sorting

After cleaning, eggs are sorted based on their size, weight, and/or quality.

Sorting Based on Egg Size

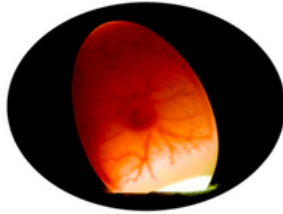
Size	Weight Range (grams/egg)
Jumbo	70 and above
Extra Large	65-70
Large	60-65
Medium	55-60
Small	50-55
Pullets	45-50
Peewee	40-45
First Egg	Below 40



Hatchery Activities

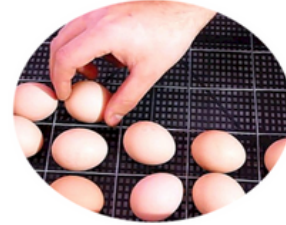
Should you decide to mate your layers with the roosters, these are the activities that you will perform.

Egg Candling



Perform egg candling to check the viability of the eggs. Do this by placing the eggs against a bright light. Observe for dark shadows and the presence of a reddish spot connected to blood vessels. These indicate signs of life in the eggs.

Egg Turning

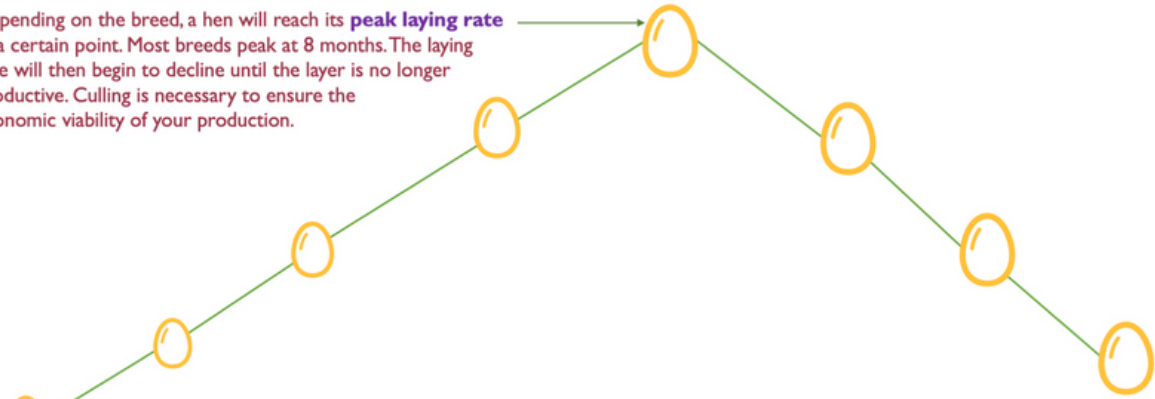


If the egg turns out to be fertilized, you can support its embryonic development by tilting it to 45°C. This will prevent the embryo from sticking to the shell. Do this for 4-6 times a day within regular intervals. When properly handled, the eggs will hatch in 21 days.

CULLING

Depending on the breed, a hen will reach its **peak laying rate** at a certain point. Most breeds peak at 8 months. The laying rate will then begin to decline until the layer is no longer productive. Culling is necessary to ensure the economic viability of your production.

Egg-Laying Rate



Age of Chicken

Signs for Culling



pale, dry, shrunken combs



yellow legs/pale legs, losing pigment



surprisingly light or heavy in weight

What to do with cull chickens?



Sell



**Slaughter/
Euthanasia**

FLOCK REPLACEMENT

Most breeds of layers peak at 8 months. After this, their egg production begins to decline. Whether you decide to do selective or batch culling, you must have a population of pullets readied.



Purchase day-old chicks at least 3-4 months prior culling. This way, you will have pullets by the time you decide to cull your layers.

HARVESTING BROILERS

Pre-Slaughter	<ul style="list-style-type: none"> • Restrict feed for at least 12 hours before the slaughter. This will give you a cleaner crop and intestines that are free from poop. Do keep the water as this will give you plumper meat and moist chicken skin. • Prepare your slaughterhouse prior to transferring chickens from the coop/house. Arrange the materials for slaughter as if you were in an assembly line. • Heat water to 54 to 77°C before slaughtering the chickens. This will be used for removing the feathers.
Slaughter	<p>Tools and Materials:</p> <ul style="list-style-type: none"> • sharp knife • bucket/pail • rope • killing cone (optional) <p>Steps:</p> <ul style="list-style-type: none"> • Tie the legs of the chicken together for restraint. • If you have a killing cone, insert the head of the chicken into the narrower hole and have someone hold the legs together. If you don't have a killing cone, have someone hold the chicken upside down. Tuck the wings and the legs. • Hold the head and locate the jugular or neck. • Hold the knife with your right hand. • Turn the head to the left as if the chicken was looking away from your knife. • Make a quick, deep cut across the jugular. • Allow the blood to drain from the chicken.
Scalding	<p>Tools and Materials:</p> <ul style="list-style-type: none"> • pot of scalding water <p>Steps:</p> <ol style="list-style-type: none"> 1. Submerge the chicken in the scalding pot for 3-4 minutes. Note: water must be between 54 to 77°C. 2. Try pulling out a feather. If you can easily remove a feather, then your chicken is ready for plucking.
Plucking	<p>Equipment:</p> <ul style="list-style-type: none"> • plucking machine <p>Steps:</p> <ol style="list-style-type: none"> 1. If you have a plucking machine, place the chicken inside it. You can just sit back while the machine does the plucking for you. 2. If you don't have a plucking machine, you can just grab the feathers and pull them out with your hands. 3. Cut the head off and then cut the feet at the joints. You can keep these for chicken stock or sell them as well. 4. Rinse the chicken.

HARVESTING BROILERS

Eviscerating	<p>Steps:</p> <ul style="list-style-type: none"> • Take the loose skin at the base of the neck and above the breastbone. Make a slice. • Locate the crop and cut the connective tissue around it. Avoid rupturing. • At the back end of the carcass, just above the cloaca, there is an oil gland. Cut this off but avoid rupturing or it will taint the taste of the meat. • With the carcass lying on its back, make a cut across the vent. • Tear the carcass open. • Put your hand inside, grab the internal organs, and slowly work into the esophagus. Pull all the organs out. • Cut the vent off completely. • Tie the legs together for better packaging. • Clean the giblets: neck, intestines, liver, heart, and gizzard. These can be sold or used for stock.
Storage	<p>Equipment and Materials:</p> <ul style="list-style-type: none"> • cooler • ice • PE bags • freezer <p>Steps:</p> <ol style="list-style-type: none"> 1. Immediately place eviscerated carcass in a cooler. 2. Once all the chickens have been slaughtered and eviscerated, you can facilitate transfer to the freezer. 3. Place chickens inside a PE bag. Seal with a tape or a sealer. 4. Store in the freezer until scheduled shipment.
Transporting	<p>If you're going to sell your broilers as live weight, you will have to transport them from your farm to the slaughterhouse. Transporting should be carried out in a way that reduces stress and mortality. Transporting must also adhere to standards and laws on animal welfare.</p>
Reducing Transport Stress	<ol style="list-style-type: none"> 1. Choose suitable crates or cages. <ul style="list-style-type: none"> • high and wide enough so that the bird can stand and move around OR at least 20cm wide and 25cm high • crates with breathing holes to allow airflow 2. Add straws or bedding materials on the floor of the crate for comfort and sanitation. 3. Do not overcrowd chickens in one crate. 4. Make sure your vehicle allows for air to flow in between the crates. Chickens do not have sweat glands and suffer from heat stress if proper ventilation is not provided. 5. Provide enough water. 6. Choose the optimum time to transport the chickens. The ideal time is after sundown because there are fewer delays and chickens are more inclined to sleep. 7. Do not transport chicken for more than 12 hours.

08

This is the fleshy, usually red, crown on top of a chicken's head.

- a. Comb b. Wattles c. Fluff d. Ear Lobe

09

Chicken house or structure intended for raising meat-type chickens

- a. Brooding House b. Grower House c. Broiler House d. Layer House

10

The following are factors to be considered in setting up a chicken house, EXCEPT:

- a. Temperature and Ventilation b. Floor space
c. Accessibility to transportation d. Protection from predators

11

This is a management practice where chicks are given extra heat and proper care and management.

- a. Feeding b. Brooding c. Debeaking d. Breeding

12

Brooding temperature is too low when:

- a. Chicks pile on top of the other near the source of heat.
b. Chicks spread themselves evenly in the brooder.
c. Chicks drink more than they can take.
d. Chicks open their wings & chirp.

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The following are essential qualities of a good broiler, EXCEPT:

- a. Rapid growth & quick feathering b. Efficiency in feed utilization
c. Low mortality d. Hatchability

14

Which of the following is not a sign of a good layer?

- a. The head is moderately fine with large bold eyes.
b. Combs & wattles are enlarged & reddened.
c. Pelvic bones are thin, pliable & the distance is wide.
d. Vent is hard, round, dry & puckered.

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The following are essential nutrients needed by chickens to support life processes, EXCEPT:

- a. Protein b. Carbohydrates c. Water d. Bacteria

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