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# **Content of Agricultural Life Skills for Teacher Training Centers**

## **Part 1 Chicken Raising**

**2013**

Unofficial translation

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# Content of Agricultural Life Skills for Teacher Training Centers

## Part 1 Chicken Raising

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## Preface

Implementation of life skills in agriculture is currently very attractive in the educational sector globally.

Starting from this context, strengthening life skills in agriculture related to daily livelihood is truly essential for student teachers and students in the present and future.

Therefore, in order to understand life skills, teachers who teach agricultural life skills should:

1. Understand the content and objectives, and know how to use materials.
2. Prepare adequate materials for each recommended activity.
3. Pre-practice by themselves before teaching in classes.

I hope all teachers will pay attention to use these materials for teaching and learning in order to improve education.

On behalf of the Ministry of Education, Youth and Sport, I profoundly thank the working group and VVOB's project technical assistance for compiling all documents.

Phnom Penh, 17 June 2013  
**Minister of Education, Youth and Sport**

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The Household Chicken Raising Manual is prepared in cooperation with the Ministry of Education, Youth and Sport and VVOB.

This book is prepared in order to explain about chicken raising techniques by natural methods. It covers theories and practices in each lesson. The book will make chicken raising easier and it requires less money, furthermore it is promoting quality of health and environment education in our country.

Even though agriculture experts provided technical assistance and materials and a big effort was made to do research of relating documents for this manual, the content may not be complete for teachers to teach their students. However, this manual is a guide for teachers to do more research and prepare lesson plans to fit the actual needs. We hope that this document will enable teachers to prepare teaching materials more effectively. We look forward to seeing your constructive comments and suggestions.

**Authors Group**

### Note

*This is the translation of ឯកសារការអប់រំបំណិនជីវិតស្តីពីកសិកម្ម ផ្នែកទី ១ ការចិញ្ចឹមមាន់ (the training manual Content of Agricultural Life Skills for Teacher Training Centers Part 1 Chicken Raising) which was issued in 2013 by the Ministry of Education, Youth and Sport (MoEYS). This translation was made by VVOB (the Flemish Association for Development Cooperation and Technical Assistance and is not an official translation. We hope it may be useful to External Development Partners of MoEYS and Teacher Training Centers who wish to consult the original Khmer manual in English.*



## INTRODUCTION TO CONTENT MANUAL OF AGRICULTURAL LIFE SKILLS

This Agricultural Life Skills Content Manual is a tool to provide future teachers background information that can be used to teach agricultural life skills.

The manual consist of three parts:

- Part 1: Chicken raising
- Part 2: Fish raising
- Part 3: Organic gardening.

Together with the Agricultural Life Skills Teaching Manual and accompanying teaching aids, this set provides you with a range of ideas and methods that are suitable for your agriculture lessons. The lessons in this book provide ideas to practice skills of chicken raising. By using hands-on practice and experiential based learning as the main methodology, student

### Definition of Life Skills

*'The intellectual, personal, interpersonal and vocational skills that enable informed decision-making, effective communication, and coping and self-management skills that contribute to a healthy and productive life to ensure successfully solving daily problems'.*

Policy for Curriculum Development 2005 – 2009,  
MoEYS

teachers learn how to apply these methodologies with students in their future primary schools. The lessons promote a deeper understanding of issues related to family scale chicken raising, develop skills for problem solving, decision making, persuading and critical thinking. They also provide opportunities for raising awareness of the existence of agricultural problems and ideas for actions which can lead to behaviour change to avoid these problems, for example change to keeping chicken in confinement, use natural medicine, produce and use local resources for producing drinkers and feeders.

### Objectives of agricultural education

According to the Training-Program for primary-level teachers, taken from the MoEYS curriculum, Agricultural Education aims for students to:

- Obtain knowledge and life skills for daily livelihood; for example, skills in planting crops and farming animals to enhance families' living standards.
- Grasp skills and methodologies to impart them to primary school students through practice and experimentation
- Change attitudes and address social and economic challenges through life skills, problems solving skills, thinking skills, decision making skills, cooperation, and accountability.

### Some guiding principles for agricultural education

To meet the above mentioned objectives, we propose a number of guiding principles that should be taken into account in agricultural education:

- Installation of a garden, a fish pond and chicken houses in the PTTC is strongly encouraged, because student teachers will benefit most when they are asked to practice what they learn in a real situation.
- Agricultural education should encourage natural ways of growing crops, reducing the use of chemical pesticides and chemical fertilizer.
- In chicken and fish raising natural ways of feeding, natural ways of prevention and treatment of diseases should also be encouraged as much as possible.

### Definition of Life Skills Education

*"Life Skills based education is used to empower young people in challenging situations. It involves an interactive process of teaching and learning, which enables learners to acquire knowledge and develop attitudes and skills to support the adoption of healthy behaviours."*

UNICEF

- 
- The methodology used should focus on action-oriented, project-centered and participatory processes leading to self-confidence, positive attitudes and personal commitment. The process should be implemented through an interdisciplinary approach. This means it should be integrated in a different range of subjects (Science, social study, agriculture, general knowledge,...) and through extra-curricular learning opportunities such as project work, Green Clubs, Local Life Skills projects (LLSP) for primary and secondary education.
  - For curriculum based lessons as LLSP, the relationship between school and the communities is very important for agricultural Life Skills. The community is a valuable resource for teaching about agricultural issues and involvement of the community by projects that aim to improve the environment in the community is essential.



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## CHAPTER 1 BASIC KNOWLEDGE OF CHICKEN RAISING

### 1.1 INTRODUCTION

For Cambodian farmers raising cows, buffalos, pigs, ducks and chickens is an important occupation followed by farm work for generating income for families and improving daily livelihoods. Usually people's chicken raising is met with many challenges such as slow growth and infections. In order to get a good result in chicken raising proper techniques must be applied and the effective use of locally available resources is encouraged.

### 1.2 THE ADVANTAGES OF CHICKENS RAISING

The advantages of family chicken raising are as follows:

- It is easy for women, particularly those who don't work outside the home, to take responsibility.
- It is easy to manage and keep, and using natural feed costs less.
- Chicken manure is rich in nutrients and can be used as a good fertilizer.
- It can use traditional medicine made by natural ingredients.
- It is the food source (meat and egg) for families and increases families' economy.
- It is good for health.
- It can give a good result, in a short time between 4 and 8 months.
- Use little capital compared to other animal raising, for example pigs

### 1.3 MAJOR CHICKEN BREEDS IN CAMBODIA

#### A. Domestic breeds



**Picture 1** Kandong (Slow feathering) **Picture 2** Sampov (Local bantam) **Picture 3** Kragnas (Frizzle)



**Picture 4** Skoey (Bicolour)

**Picture 5** Samley

**Picture 6** Bantam

## B. Imported chicken breeds



Picture 7 ISA Brown leucone

There are two imported chicken breeds: one raised for meat (Plymutroot Island Papi Marok Australorp) and other raised for eggs (ISA Brown leucone).

## C. Differences between imported and domestic chicken breeds

Imported Chicken breeds	Domestic Chicken Breeds
<b>Pros:</b> <ul style="list-style-type: none"> <li>- Grow fast</li> <li>- Produce more eggs</li> </ul>	<b>Pros:</b> <ul style="list-style-type: none"> <li>- Resistant to weather and diseases</li> <li>- Not choosy about food</li> <li>- Can hatch the chicks by themselves</li> </ul>
<b>Cons:</b> <ul style="list-style-type: none"> <li>- Not resistant to weather, susceptible to diseases</li> <li>- Choosy about food</li> <li>- Not suitable for family chicken raising</li> <li>- High cost and always need care by following specific techniques.</li> </ul>	<b>Cons:</b> <ul style="list-style-type: none"> <li>- Small body</li> <li>- Grow slowly</li> <li>- Produce less eggs (60 eggs/year)</li> </ul>

## 1.4 CHICKEN BREED SELECTION AND BREEDING

The selection of breeds is very important as good breeds grow fast, are resistant of diseases, can be marketed at a high price and can be kept as future breeds. Breeding should avoid breeding between chicks and their parent hens or cocks and hens born from the eggs laid by parent hens.

### A. The criteria for selecting of good breeds

- Know the background of the chickens clearly and know that the place where they came from does not have disease.
- Provide lots of eggs (more than 10 per reproduction). Can hatch eggs without help, and can take care of chicks.
- Physically tall, wide rump or tail, absence of virus
- Aged 5-6 months
- Good health, agile, red crown and bright eyes
- Moisturized skin, no wounds like a crooked beak and feet

- It is available locally
- It can be fed by natural food
- There should be a market demand for the breed

### B. How to select a cock

- It is physically big, and it has no history of spreading diseases.
- It is agile and good at copulating with a hen
- It is aged between 9 months and 3 years
- It should be 2 kilograms or over in weight
- One cock can serve 10 to 12 hens
- 3 year old cocks need replacing with a new one.



**Picture 8** Chicken cage for reproduction

### C. How to select a hen

- It is big, strong, and resistant to diseases
- It should be 1.5 kilograms
- It is aged 7 months to 3 years
- It lays eggs at least 4-5 times per year
- It produces 8-12 eggs per generation
- At least 9 eggs are hatched per generation
- Its legs are yellow colour
- It is docile and does not bite its chicks or the chicks of other hens.
- Old hens or ones that do not meet the above description have to be replaced.

### D. Select good eggs for breeding

- A hen is physically big, strong, and resistant to diseases
- The eggs are of 2<sup>nd</sup> or 3<sup>rd</sup> generation
- The egg shell is white
- It is heavier than other eggs
- The eggs sink, when dropped in the water

### E. Select chicks

- Big physique, shrill voice, agile, broad shoulder
- Manure does not cling to the rump
- Yellow beak and yellow legs
- Red face and clear eyes

## **F. Keeping chicks**

- Newly born chicks should be deprived of feed for a period of 12 hours as their bodies have their own nutrition. If they are fed, they can die.
- Feed anything easy to digest or fine grains such as bran, broken rice
- The feed of chicks is placed in a feeder with a combination of protein, meat, green vegetable, and a little amount of salt (the amount of bran is equal to that of vegetable)
- Don't separate chicks from their hen immediately (Keep them with their hen for 3-7 days)
- Don't expose chicks to rain and heat too much
- The chicken houses for chickens should have sufficient ventilation where the highest temperature is 35 degrees and the lowest is 26 degrees.
- Be careful with the wind at night time.

## **1.5 THE GROWTH OF CHICKENS**

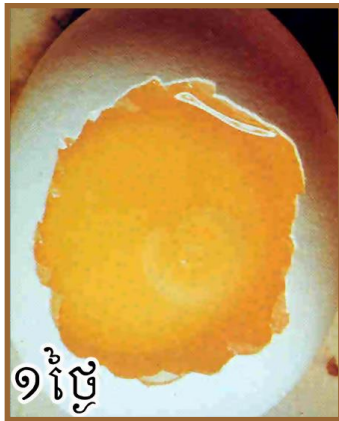
### **A. The growth of eggs**

Usually, eggs are hatched on the 21st day (exceeding or less than 3 days) when a hen begins to lay eggs.

- The development of a chick embryo in the egg is done by the heat from a mother hen incubating her eggs (natural hatching) or by using a machine (artificial hatching). By looking at the eggs through lens, the life cycle of a baby chick can be divided into the following stages:
- Day 4: A black bean-sized shape is visible. If not seen, it means that the egg is spoiled.
- Day 7: Arteries are seen to be spread from a black spot, and the air cell looks paler than other parts. If the black shape is in motion, it means that the egg is spoiled.
- Day 9: A lot of arteries are visible; the air cell is seen clearly, long, black and moveable.
- Day 12: The embryo is about a coin size. When moving, the artery is seen clearly.
- Day 17: One third of the egg is empty and the rest is full of the black shape. The beak of the baby chick is visible.
- Day 20: The embryo completely fills the egg shell and it cannot turn its body.
- Day 21: Hatching of chick.

Therefore, when a mother hen incubates her eggs, the temperature should be between 30 to 37 degrees Celsius. If the temperature is over 42 degrees Celsius, it will damage the arteries and cause the death of the embryo. The egg should be turned every 4 hours so that the temperatures of the upper and lower parts of the egg are equal.

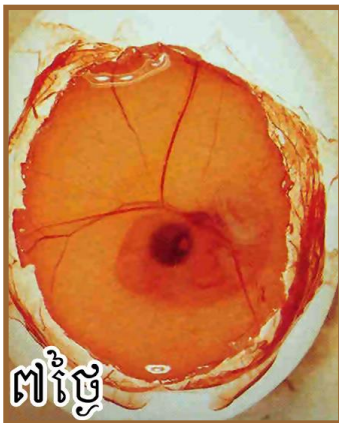
Day 1



Day 4



Day 7



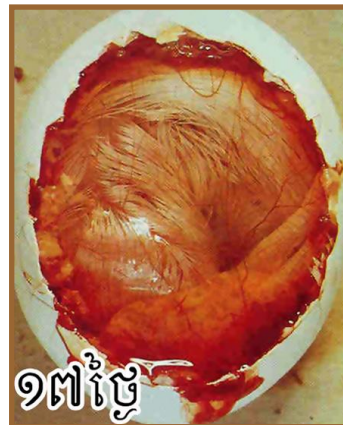
Day 9



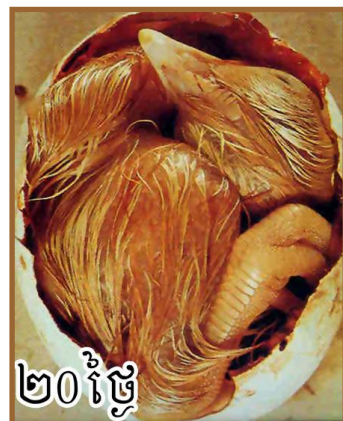
Day 12



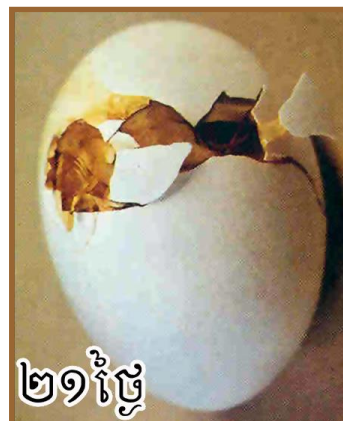
Day 17



Day 20



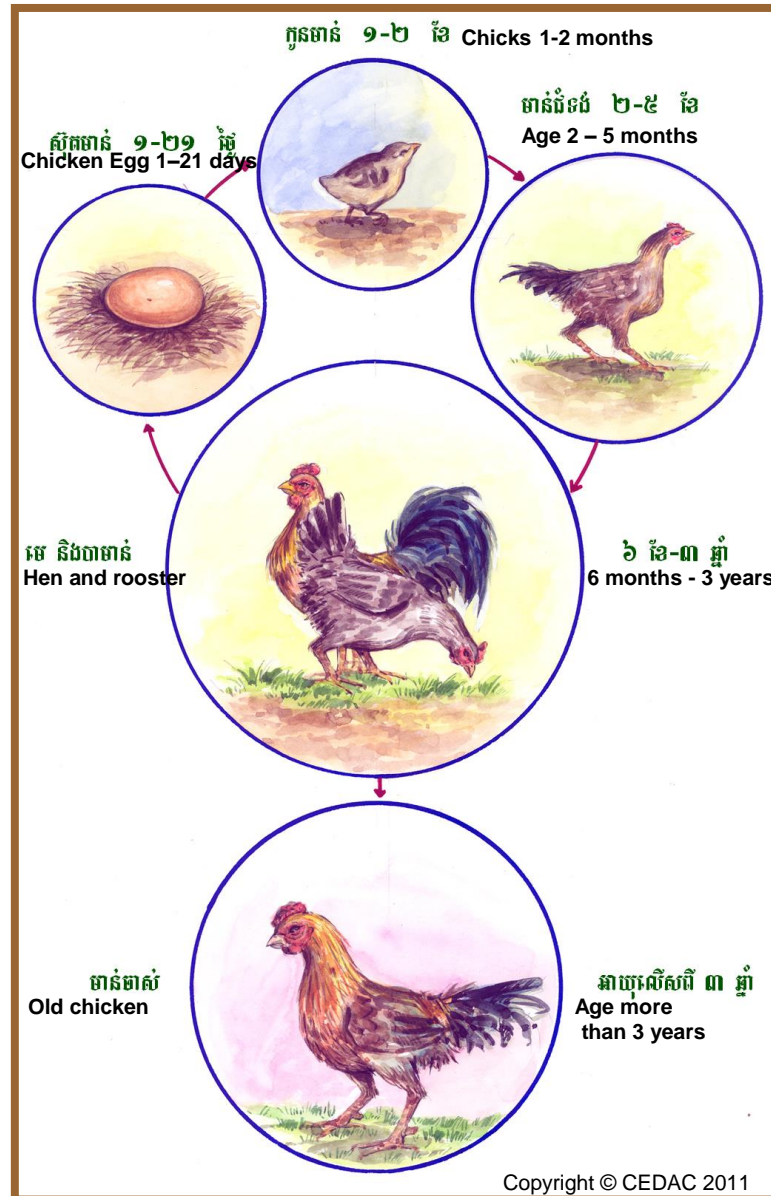
Day 21



Picture 9 Egg growth Copyright © CEDAC 2011

## B. The growth of chickens

In general the growth of chicken is divided in 5 main stages: egg stage, chicks stage, adult stage, reproduce stage, old stage. Management and taking care of chickens have to be adapted according to each stage.



Picture 10 The steps of chicken growth

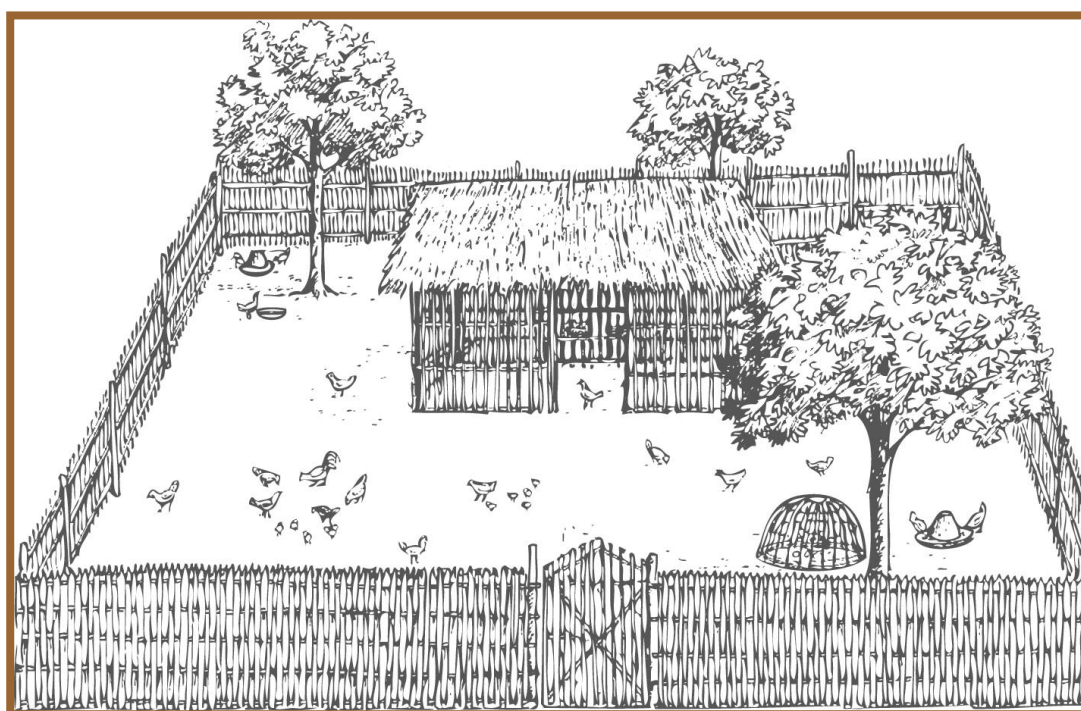
### 1.6 TRANSPORT AND KEEP CHICKENS

- Buy adult chickens rather than chicks to avoid death
- Place chickens in the same cage; but too many chickens in the cage can make them tramp on each other and they can die.
- Avoid hanging chickens by tying their legs with strings
- The cage must have sufficient ventilation
- After transporting them for 1 hour, give them water mixed with vitamin powder or sugar to re-energize them.
- Upon arrival, they should be kept separately for 14 days before they are released into other flocks of chickens to ensure they do not transfer diseases.

## CHAPTER 2 CHICKEN HOUSE PREPARATION AND CONSTRUCTION

### 2.1 REASONS FOR RAISING CHICKENS IN A CHICKEN HOUSE AND FENCE

- Protects chickens from being killed by prey
- Prevents them from destroying various crops
- Prevents chickens from being exposed to bad weather (wind, rain, heat)
- It is easy to maintain and easy to provide food and water
- It is easy to keep them for vaccination and daily health check-ups
- It is easy to control chickens: Separating chicks from a hen and big chickens, separating the laying chickens from other chickens
- Ensures the protection of the environment and humans from being infected with chicken's diseases – such as bird flu
- It is easy to be used for consumption and sale



**Picture 11** Chicken house and fence

### 2.2 THE CONSTRUCTION OF FAMILY SIZED CHICKEN HOUSE

The construction of the chicken house depends on the number of chickens you want to raise, but you should follow the density per  $1\text{m}^2$ . For example, if the chicken house is  $2\text{ m} \times 3\text{ m}$  in height; the door of the chicken house is  $0.6\text{ m} \times 1\text{ m}$  and it has a fence or net of  $300\text{ m}^2$  to provide space for chicken to find food, then this size can contain 10 hens and 40 chicks. You should use the resources available in the village such as bamboo, tree twigs, straw, dried leaves, to lay it on the ground of the chicken house so that it can absorb moisture. Alternatively let grass grow in the area where chickens walk, to generate more food such as worms and insects.



## **A. Criteria for constructing a chicken house**

- Build the chicken house on high ground
- Build the chicken house near the house for safety and easy monitoring
- Build the chicken house along the side with the sunlight
- Have a wall with good ventilation
- Have a cover available for protection from rain or wind
- Make sure there is enough shade, for example the shade of a tree
- Have space for chickens to walk outside the chicken house
- Create a good space for placing drinkers and feeders
- It can be covered with straw, husk, or dried leaves (so that they absorb moisture from the saliva of chickens and provide insects to chickens)

## **B. Organizing environment inside the chicken house**

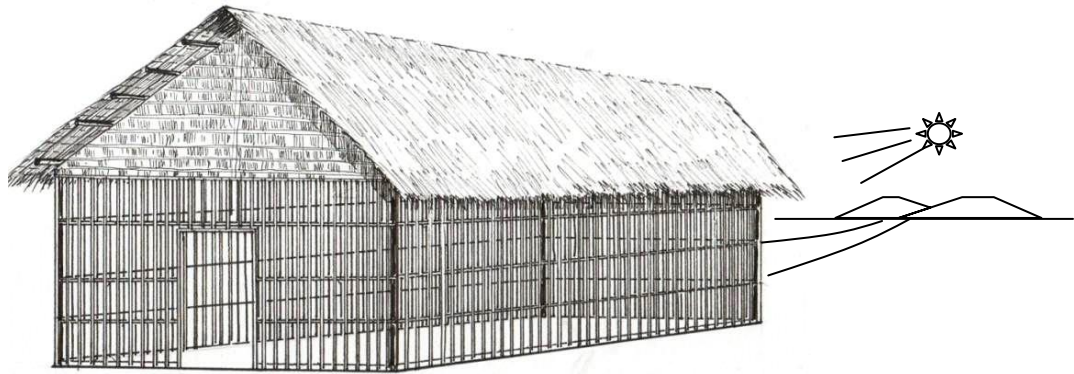
- In the chicken house, there should be shelves built for chickens to sleep and lay eggs.
- There should be enough shelves with nests in the pen for all mother hens to lay eggs;
- The nests can be made of baskets or cases with a size of 30 x 40 centimetres, and lay the nest bottom with straw, banana leaves or sacks. To protect the hen nests from mites, tobacco leaves or tobacco should be laid at the bottom of each nest;
- There should be drinkers and feeders inside and outside the pen so that the hens can easily find water and food;
- Before putting hens into the chicken house, the chicken house premises should be sterilized by spreading lime on the surface and leaving it for 1 or 2 weeks;
- Do not raise the chickens under the house because this can affect human health;
- 3 chickens need at least one square meter area.

## **C. Organize the environment around the chicken house**

- Create a natural environment for daytime. If there is no shade, papaya or other trees can be grown.
- The space around the chicken house must have enough sunlight and a balance of shade and sunlight.
- Build a fence surrounding the space, and grow plants which can provide food for chickens.
- Arrange the place for chickens to find more insects.
- Spread compost for the growth of insects
- Often sweep and clean the premises;

## 2.3 THE FEATURES OF A CHICKEN HOUSE

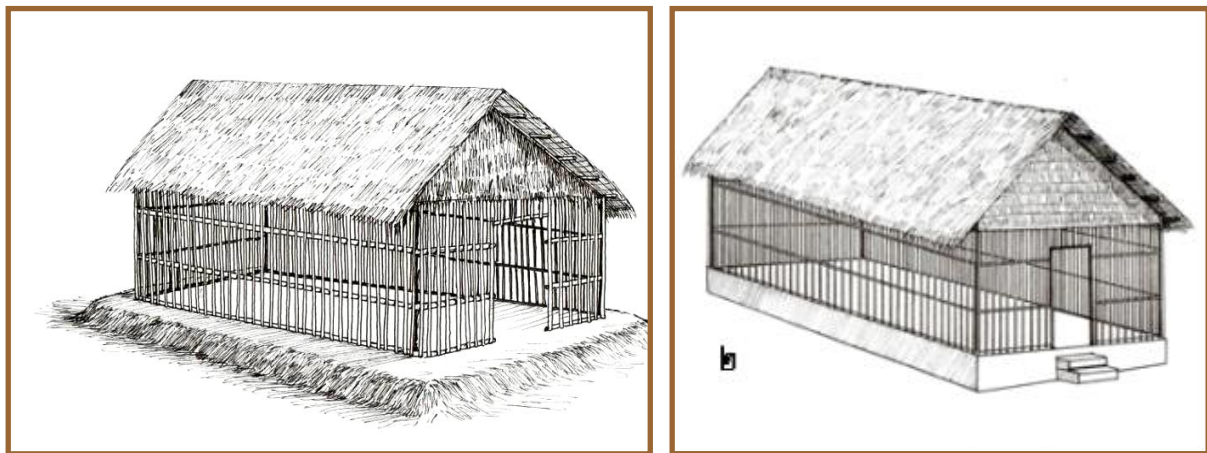
### A. General



**Picture 12** Chicken house aligned with the sun

- Place young chickens (aged 1 month and a half or 0.025 kg in weight) at 10 chickens/m<sup>2</sup>
- Place 2-3 adult chickens/m<sup>2</sup>
- Benefits by preventing chickens from being exposed to sunlight which affect their health (noon time or raining) and providing shelter

### B. Construction of a chicken house on raised grounds



**Picture 13 and 14** Chicken houses which are on raised grounds.

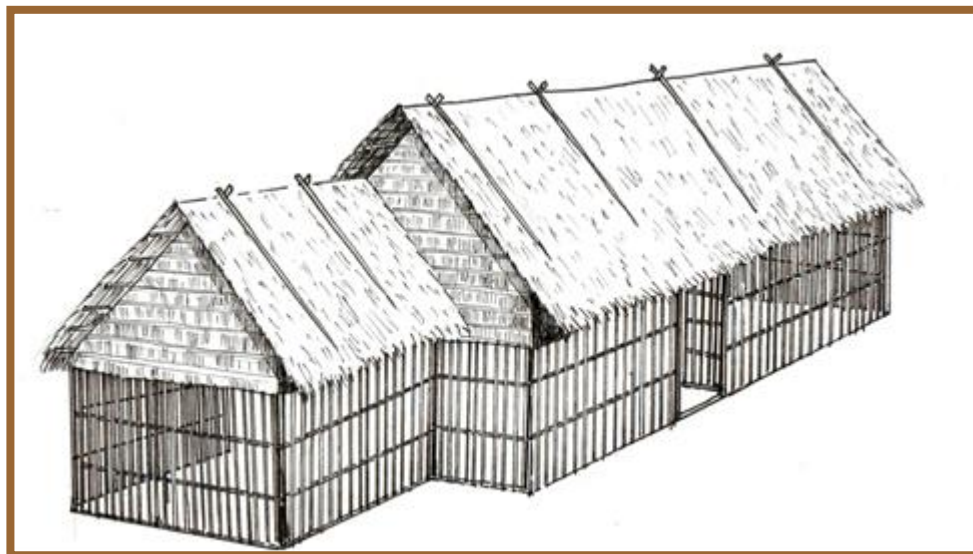
- It is suitable for family chicken farming
- It is suitable for families who have small space
- It is easy to build and cheap
- Build a hillock (Filled with earth or paved with cement) to prevent rain or water from making the chicken house dirty



**Picture 15** A chicken house on poles

- It is suitable for all kinds of geographic areas, particularly flooded land or watery land.
- It is suitable for large-scale raising (raising chickens for meat)
- It is easy to clean, but it is more expensive than other chicken houses

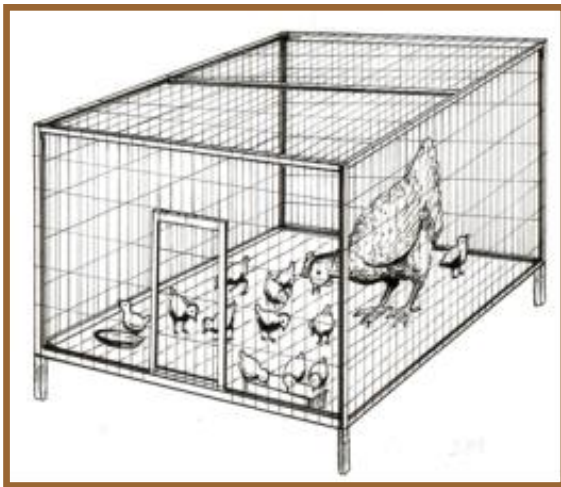
### **C. Double room chicken house**



**Picture 16** Double-room chicken house

- It is suitable for micro and medium sized chicken raising
- It is easy to clean
- It is suitable for the areas which are not flooded during the rainy season
- It has different sections for separating chickens according to the type of production
- Easy to divide the space for hens which lay the eggs and that are hatching.

#### D. The cage for brooding and separating chicks



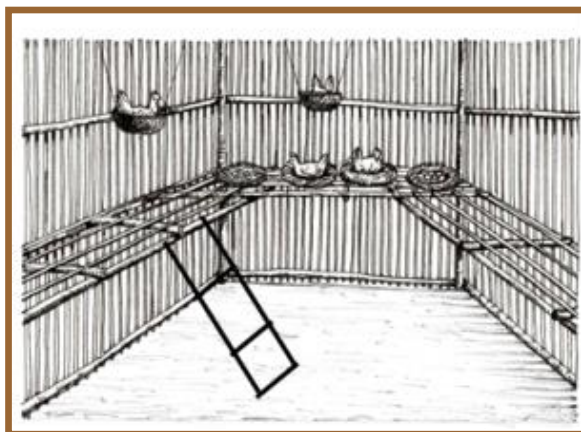
**Picture 17** Chicken cage for brooding



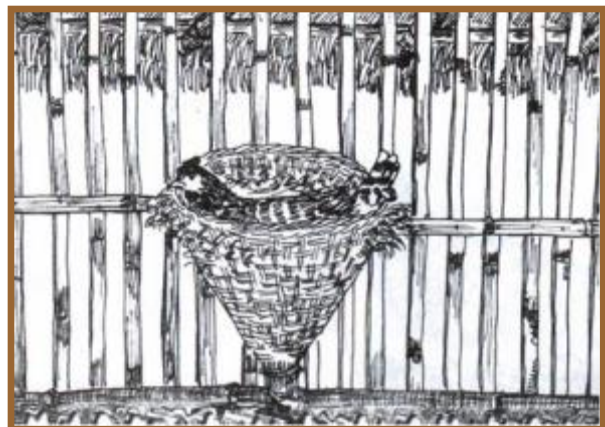
**Picture 18** Chicken cage for temporary separation

- Easy to move
- Place 14 chicks which have just been hatched for 10 days per  $m^2$
- Height is from 0.5 m to 0.8 m
- It is easy to administer vaccination
- It prevents chicks from dangers or diseases, and it can be used to brood sick chicks separately.
- Easy to clean
- Easy to keep chicks warm

#### E. The chicken house for chickens to lay eggs



**Picture 19** Shelves for sleeping and laying eggs



**Picture 20** Chicken nest

- Place only one hen/ $m^2$
- The bottom of a nest is covered with net to be easy to turn eggs
- Hens should have sleeping space
- Construct a ladder for chickens to climb to sleep or lay eggs
- The nest can be made of old materials such as the paper box, baskets or others.

## F. The construction of chicken housing for commercial purposes

- High cost because of the demand for technique and modern equipment
- Manage and maintain the development of chickens
- Needs a heating system for chickens
- Needs a sterilizing system to avoid the outbreak of diseases
- Needs a large space or to be far away from the house.



**Picture 21** Commercial chicken raising

## CHAPTER 3 CHICKEN FEED

### 3.1 TYPES OF CHICKEN FEED

There are 4 main groups of feed that chickens need: body building feed, energy giving feed, protective feed and mineral feed. Lack of any element of the said feed leads to changes in functions of organs and the organs will grow slowly.

General purpose of feed:

- Good feed must be composed of 2-3 ingredients such as cereal, grains and animals;
- Occasionally, give synthesized substances such as primex and salt in the feed;
- Frequently, give additional green plants such as leftover green vegetables;
- Give feed and water in an amount enough for eating and drinking for 1 day;
- Clean feeders/drinkers every morning and replace feed and water in the feeders/drinkers every day;
- The types of feed vary according to ages and types of productions (eggs, meat).

**Table of feed groups**

Feed groups	Importance	Deficiency	Sources
Body building food (meat and protein)	<ul style="list-style-type: none"> <li>- stimulates growth and reproductive capacity</li> <li>- builds bone, meat, feather;</li> <li>- supports health</li> </ul>	<ul style="list-style-type: none"> <li>- stunted, slow growth</li> <li>- decrease in reproductive capacity</li> <li>- susceptible to diseases</li> </ul>	Body building food can be found from plants and animals such as in powder or dried fish, tiny shrimp, earthworm, insects, cereal grains, soybean, green bean, peanut, sesame, duck weed, water spinach, amaranth, etc.
Energy giving food	<ul style="list-style-type: none"> <li>- supports body health</li> <li>- helps with digestion</li> <li>- provides heat to body</li> <li>- Nutrition absorbing</li> <li>- Strengthens ability of reproductive and nervous systems</li> </ul>	<ul style="list-style-type: none"> <li>- lots of diseases</li> <li>- less outputs</li> <li>- stunted, slow growth</li> </ul>	Energy food can be found from plants and animals such as in cassava, sweet potato, taro, rice bran, animal fat, vegetable oil, desiccated coconut meat, broken rice, corn, sugar syrup and fermented rice.
Protective food (vitamins)	<ul style="list-style-type: none"> <li>- synthesizes nutrition from feed</li> <li>- supports health</li> <li>- stimulates growth</li> <li>- protect from viruses</li> <li>- help stomach to process food</li> </ul>	<ul style="list-style-type: none"> <li>- malfunction of organs</li> <li>- decrease in health</li> <li>- slow growth</li> </ul>	found in green plants and yellow plants such as carrots, ripe fruits, ripe pumpkin, cereal grains

Mineral feed	<ul style="list-style-type: none"> <li>- stimulates bone growth</li> <li>- grows well</li> <li>- prevents diseases</li> </ul>	<ul style="list-style-type: none"> <li>- stunted, pale</li> <li>- low egg production capacity, low reproductive capacity</li> <li>- osteoporosis, cage fatigue</li> </ul>	found in green plants, vegetables, cereal grains, powder, snail, crab, oyster shells, salt and small snail
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### 3.2 NATURAL FOOD PRODUCTION

Prepare places for chickens to scratch (chickens' compost) as below:

- under tree shade;
- dig a hole around a fruit tree;
- make a 30-centimeter fence around the hole to prevent chickens from scratching garbage out of the hole;
- collect tree leaves, rice husks or other substances and put in the frame (except for animal manure); frequently water the compost and add some soil so that it is rots fast; when the compost is rotten, remove it from the hole and replace it with new tree leaves and garbage.

**Table of chicken food sources**

Sources	Type
<b>In water</b>	Water spinach Duck weed Water hyacinth Tiny shrimps Tiny fish, etc.
<b>On market</b>	Corn Unhusked rice Beans Broken rice Rice bran, etc.
<b>Nearby the house</b>	Mulberry leaves Horse tamarind leaves Sweet potato leaves Coccinia cordifolia leaves Malunggay leaves Earthworms Termite Worms Kitchen waste Leftover rice (not spoiled)



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Picture 22a to 22i Plants for producing natural chicken food



## A. Common food

The importance of chicken feed that we produce ourselves is that it is cheaper than the feed we buy from the market; existing materials are available, and it is easy to find and simple.

**Table of food recipes for chicks (from hatching up to 3 weeks) 30-70g per chick/day**

Feed Ingredients	Option 1	Option 2	Option 3
1) rice bran	3 kg	3 kg	3 kg
2) broken rice	3 kg	3 kg	3 kg
3) fish powder	1 kg		
4) earthworm		1.5 kg	1 kg
5) termite			0.5 kg
6) yellow corn powder	1 kg	2 kg	2 kg
7) roasted soybean powder	2 kg		
8) Malunggay leaves		0.5 kg	0.5 kg
9) salt	0.05 kg	0.05 kg	0.05 kg
10) Premex (available on market)	0.05 kg	0.05 kg	0.05 kg
Total	10.1 kg	10.1 kg	10.1 kg

Note: Basically, animal feed focusing on protein consists of other substances running in protein. Horse tamarind leaves should not exceed 4% because it makes chickens stunted or it pauses the growth of chicks. During the first 2 weeks, chicks need to eat powdered feed.

**Table of feed recipes for laying hens = 70-100g per hen/day**

Feed Ingredients	Option 1	Option 2	Option 3
1) rice bran	3 kg	3 kg	2 kg
2) broken rice	1 kg	1 kg	1 kg
3) fish powder	1 kg		
4) earthworm		1 kg	1 kg
5) termite			0.5 kg
6) yellow corn powder	3 kg	2 kg	2 kg
7) roasted soybean powder			0.5 kg
8) Malunggay leaves	1 kg	1 kg	1 kg
9) Duck weed	1 kg	2 kg	2 kg
10) snail, clam shells	0.1 kg	0.1 kg	0.1 kg
11) salt	0.05 kg	0.05 kg	0.05 kg
12) Premex (available on market)	0.05 kg	0.05 kg	0.05 kg
Total	10.2 kg	10.2 kg	10.2 kg

**Table of feed recipes for broiler chickens = 70-200 grams per head/day**

Feed Ingredients	Option 1	Option 2	Option 3
1) rice bran	3 kg	3 kg	4 kg
2) broken rice	2 kg	1 kg	
3) fish powder	1 kg	0.5 kg	
4) earthworm		0.5 kg	0.7 kg
5) termite			0.3 kg
6) yellow corn powder	2 kg	2.5 kg	3 kg
7) roasted soybean powder	1 kg	0.5 kg	
8) Malunggay leaves	1 kg	1 kg	1 kg
9) Duck weed		1 kg	1 kg
11) salt		1 kg	1 kg
12) Premex (available on market)	0.05 kg	0.05 kg	0.05 kg
Total	10.05 kg	11.05 kg	11.05 kg

## B. Duck weed (Azolla)

It can be used as chicken feed by just collecting it from a pond, letting it partially dry, mixing it with rice bran and then you can feed your chickens. Preparation of duck weeds raising in a hole:

- dig a 2 x 3 meter-sized, 0.3-0.4 meter-depth hole (subject to soil condition);
- lay a plastic cover out flat at the bottom of the hole and then flood the hole with 0.2-0.3 meter-depth of water;
- mix cow dung or pig manure with water and then pour it into the hole;
- put in 1 kg of duck weed seeds into the hole;
- maintain water in the hole.



**Picture 23** Duckweed / Azolla

## C. Earthworm cultivation

Red earthworms can be used to feed chickens after 40-45-day raising by chopping or mixing them with other ingredients (rice bran, unhusked rice, broken rice etc.)

- dig a 0.3-0.4 meter-depth hole on not floodable land or use an old water jar;
- lay a plastic cover out flat at the bottom of the hole or cement the hole to prevent earthworms from going down into the earth;
- put in compost made of cow dung (wet or dry) mixed with bits of plants;
- put in fertilizer with earthworm breeds; keep the fertilizer slightly wet but not very wet;
- cover the hole with palm leaves or plastic bags;
- replace the compost with new compost when taking the old compost to feed chickens.

## D. Insect traps

Prepare it similar to earthworm raising, but don't use a plastic cover to lay out flat at the bottom of the hole.

- make compost with animal manure and bits of plants;
- break a large termite nest and put it in the compost;
- make a fence and protect it with tree branches or bamboo thorn;
- keep watering it so that it stays slightly wet;
- prepare it at many places around the premises of chicken house.

## E. Preparing places for chicken to scratch

Preparing places for your chicken to scratch (chicken's compost) enables the chicken to grow faster because they get to eat plenty of insects which consist of meat. You can also avoid other losses because the chickens will not walk far away from your house. In addition, the chicken's compost is composed of fertilizer that can be used for fertilizing other crops as well.

- Select a place with tree shade
- Dig a 0.3-meter depth and 3 x 4-meter size hole (or based on real situation) around the tree.
- Set a 0.3-meter height fence around the hole to prevent the chicken from scratching trash out of the hole.
- Collect tree leaves, cattle manures, rice husk and other materials and put them inside the frame. Water it frequently, especially during dry season, and chop the elements inside the frame to produce insects that are feeds for chicken.

## F. Nutrition feed yeast

In order to increase their growing efficiency and resistance to other infections, nutritional feed yeast can be produced for chickens.

Feed yeast is easy to produce, using only normal feed ingredients which are easy to find such as all kinds of fruits and vegetables etc. The general procedures for making the feed yeast is as follows:

### Recipes

- Fresh materials: fresh vegetables, plant bulbs, fruit, etc. Mix all of this in equal parts.
- Palm sugar 1 part

### Procedure

- Mix all the materials together thoroughly.
- Put it into a bucket/glass and cover to prevent the air to go inside
- Keep it in a shady place for at least 15 days and often open it for a short period a time a day to release the air to prevent it from exploding.
- When all the mixed materials are well fermented it will release a nice smell, a sour taste that is similar to the taste of lemon.
- Extract the water from the and mix it with water for chicken to drink or mix it with food for chicken to eat every day, 1% of the total food intake.  
Example if we take in 1 kg of food or 1 litre of water, we put 1cc of the yeast.

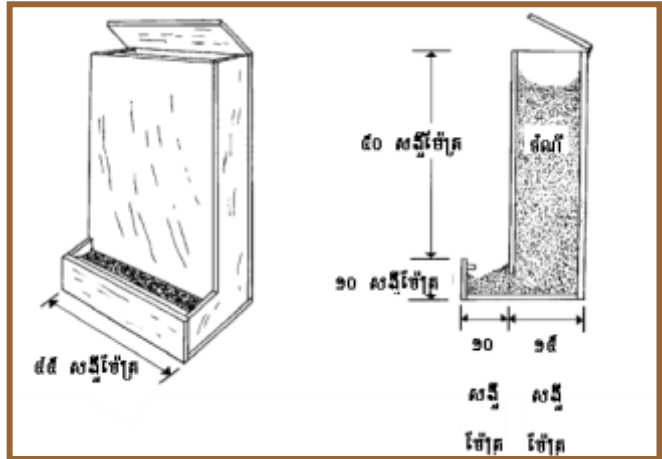
### 3.3 HOW TO PRODUCE FOOD AND WATER FEEDERS

We can produce food and water feeder by using existing local materials such as plastic bottle, bamboo and plastic pipe.

#### A. Food feeders

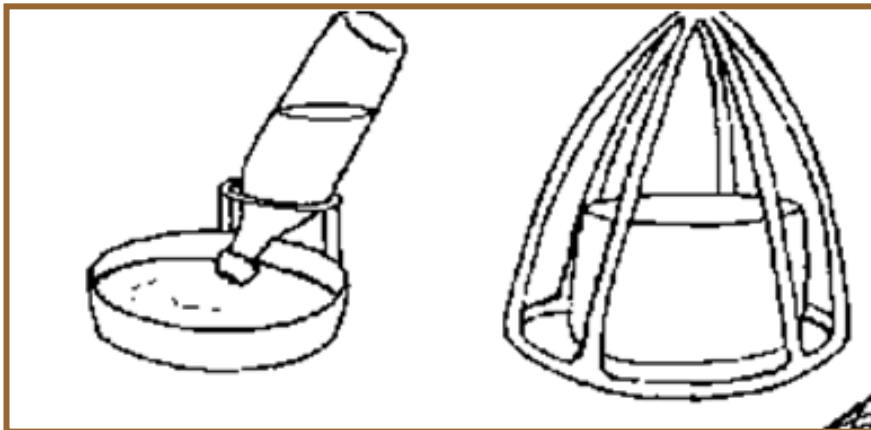


Picture 24 Chicken feeder



Picture 25 Wooden food container

#### B. Water feeders



Picture 26 and 27 Drinkers



More detailed content related to how to produce food and water feeders can be found in the video clip (3.4.3 Lesson 3).

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### 3.4 HOW TO FEED FOOD AND WATER

#### A. How to feed

Enough feed means that chickens are satisfied with feed and that the feed quality is appropriate for the growing and living needs of the chickens.

- 1-15 days old chicks should be fed 4-5 times per day and later on reduced by 2-3 times;
- Cockerels/pullets need 10 grams of feed per day;
- Feed must be placed in feeder and replaced daily;
- Feeders must be cleaned with water every morning to prevent feed from spoiling;
- Chicken feed mixed with multi ingredients should be cooked and powdered so that it is easy for chickens to digest and absorb vitamins as much as possible;
- Mix 1 portion of sand with 4 portions of snail, or oyster shells and put them separately in the feeder in order to help the digestive process in the chicken's gizzard and to improve the capacity to absorb the nutrition.
- Do not feed the newly hatched chick for at least 12 hours because they still have reserve food, otherwise, it will cause the chick to get stomach problems or to die.

#### B. Giving freshwater to chickens

Water is one of the most important things for chicken, approximately 65%-70% of the whole body consist of water. Drinking water must be clean water and enough for each age of chicken, and it is one of the main factors because it helps:

- feed digestion and absorption;
- transmittance of digested nutrients to the organs;
- transmittance and discharge of wastes;
- balancing of body temperature;
- removing and cleaning poisoned substances from the body;
- fast growth and increased numbers of eggs

Remarks: Should put neem cover, Bandol Pech stem, neem leaves, Prok Ple, Elephant's nose plant, ginger, garlic, lemon grass, etc.

## CHAPTER 4 DISEASES AND PREVENTION

### 4.1 MAJOR CHICKEN DISEASES

Health decline of birds such as chickens and ducks which is caused by bacteria, virus, environmental factor, and other factors.

**Table of diseases of chickens**

Types of diseases	Causes of diseases	Symptoms	Prevention
1) Newcastle disease	<ul style="list-style-type: none"> <li>- caused by virus;</li> <li>- affecting chickens of all ages, particularly chicks and cockerels/pullets;</li> <li>- infected by mixing with others</li> </ul>	<ul style="list-style-type: none"> <li>- decline, depression, falling wings, standing alone, shaking, twisted neck;</li> <li>- eating less or not eating at all;</li> <li>- body temperature rising up, drinking lots of water;</li> <li>- at first, blue diarrhea with bad smell, after that the manure turns hard like lime;</li> <li>- drop in egg production (soft-shelled egg);</li> <li>- short breath with husky voice;</li> <li>- high death rate but chickens have chance to recover by themselves.</li> </ul>	<ul style="list-style-type: none"> <li>- vaccination</li> <li>- separate sick chickens from chickens with good health;</li> <li>- clean the house with lime;</li> <li>- no medicines for treatment.</li> </ul>
2) Chicken cholera	<ul style="list-style-type: none"> <li>- caused by virus; affecting chickens of all ages and other birds as well;</li> <li>- infected by mixing with others.</li> </ul>	<ul style="list-style-type: none"> <li>- <u>Severe condition</u>: death without clear signs within 24 hours;</li> <li>- <u>Medium condition</u>: temperature rising up, depression</li> <li>- not eating;</li> <li>- bruised comb, slippery liquid on the beak and nose;</li> <li>- difficult to breath;</li> <li>- chickens pass waste a lot, light yellow manure, vent soiled with manure around it (1-3 days);</li> <li>- chicken die;</li> <li>- <u>Mild condition</u>: burned eyes, nose and ear (with yellow liquid), twisted neck;</li> <li>- unable to walk, wings fall down.</li> </ul>	<ul style="list-style-type: none"> <li>- traditionally: blend 10gms of white onion base, 50 gms of ginger, 30 gms of palm sugar and ferment it for half a month and then administer it to chicken at 1cc per head.</li> <li>- technically: Vaccination;</li> <li>- clean house and equipments;</li> <li>- separate sick chickens from chickens with good health and then bury or burn them;</li> <li>- give chickens enough fresh water.</li> </ul>

<p>3) Bird flu</p>	<ul style="list-style-type: none"> <li>- caused by virus called H<sub>5</sub>N<sub>1</sub>;</li> <li>- affecting chickens of all ages and other birds as well;</li> <li>- infected by mixing with others.</li> <li>- infected by equipments;</li> <li>- high death rate of chickens</li> </ul>	<ul style="list-style-type: none"> <li>- not eating, depression</li> <li>- body temperature rising up, drinking lots of water;</li> <li>- dull-coloured feathers;</li> <li>- bruised and swollen head and neck;</li> <li>- swollen hock, bruised shank;</li> <li>- diarrhea, runny nose, sneezing;</li> <li>- feed in the crop not dissolved;</li> <li>- soft shell or no shell egg;</li> <li>- sudden death in large numbers, no chance to recover.</li> </ul>	<ul style="list-style-type: none"> <li>- cannot be cured;</li> <li>- vaccination;</li> <li>- clean cage and equipments;</li> <li>- give enough feed and water;</li> <li>- do not eat chicken that died of disease;</li> <li>- kill the sick chicken and bury the dead chicken;</li> <li>- clean hands and feet.</li> </ul>
<p>4) White diarrhea</p>	<ul style="list-style-type: none"> <li>- caused by virus;</li> <li>- affecting chickens at 1-15 days old;</li> <li>- death rates from 40-50%;</li> <li>- it can also affect adult chickens especially laying hens.</li> </ul>	<ul style="list-style-type: none"> <li>- Chicks: stand motionless with eyes shut, eat less or don't eat at all;</li> <li>- chicks often gather at place with heat;</li> <li>- body temperature rises up, drink lots of water;</li> <li>- diarrhea with dull white-coloured manure, getting thinner and thinner;</li> <li>- feathers stand on end, vent soiled with manure;</li> <li>- shaking body, twisted neck and then die;</li> <li>- Chicks: diarrhea, dull-coloured feather;</li> <li>- pale comb, getting thinner and thinner;</li> <li>- less eggs, soft-shelled eggs.</li> </ul>	<p><u>Treatment using natural medicine:</u></p> <ul style="list-style-type: none"> <li>- Grind and wring 30 gms of Cassia Siamea leaves to get its juice and then mix the juice with 1kg of sugar, leftover for 1 week, then mix it with 10 litres of water. Administer 1 spoon of medicine per chicken.</li> <li>- Prevention: clean cage, feeders and drinkers;</li> <li>- Separate sick chickens from good health chickens;</li> <li>- Prevent infections from other animals (mouse).</li> </ul>
<p>5) Avian pox</p>	<ul style="list-style-type: none"> <li>- caused by virus</li> <li>- affecting chickens of all ages, particularly chicks and cockerels/pullets;</li> <li>- the main infectious agents are mosquitoes and other blood sucking insects;</li> <li>- it can also be infected by exposure</li> </ul>	<ul style="list-style-type: none"> <li>- tumors exist on skin and areas without feathers, head, neck, vent and legs in the form of diphtheria, difficult to breath, with scabs blocking nose holes;</li> <li>- rheum exists in the eyes, blind;</li> <li>- difficult to eat and drink;</li> <li>- slow growth.</li> </ul>	<ul style="list-style-type: none"> <li>- Grind (?) peeper and administer to sick chickens 2 times a day (1 tablet for chicks, 2-3 tablets for adult chickens) and then apply ground peeper to scabbed areas;</li> <li>- grind a handful of Abrus precatorius nuts with a handful of red lime powder and apply it to scabbed areas, 3 times per day for 3 days;</li> <li>- force feed ripe chilly (2-3 chillies for chicks and cockerels/pullets, 5-10 chillies for adult chickens) for 3 days;</li> </ul>

	between sick fowls and good healthy fowls.		- Prevention: Vaccinate the chickens, clean the pen, protect chickens from mosquitoes, remove scabs from chicken body and then clean the injured areas with sour juice or salt water.
6) Roundworms	- makes the chickens have stomach pain; - releases poison which makes it easy for other infections to invade.	- pale, dried feather; - getting thinner and thinner, out of strength; - eat less; - slow growth; - weight loss, less eggs; - manure with worms; - chicken die.	- clean feeders and drinkers; - separate sick chickens from good healthy chickens; - mix 3 gms of areca palm nut slices or 3 gms of Combretum quadrangulare (Takeo bushwillow) with water and let chicken drink.

#### 4.2 HYGIENE AND OTHER DISEASES PREVENTION

- build chicken house separately and away from house/enclosure of other animals;
- keep new chickens for 14 days before mixing with others;
- eliminate source of dirty water around the house, chicken house and the yard around chicken house ;
- clean the chicken house and feeders/drinkers every morning;
- feed and water must not be spoiled;
- whenever infections break out, clean and kill viruses on the pen, feeders, drinkers and premises around the chicken house with white lime. Leave the chicken house empty for 2-4 weeks before raising new chickens in it;
- remove the used chicken nest pads and burn them to prevent louses or mites;
- do not buy any chickens which are suspected sick from market or village where there is an outbreak of infections, to raise or eat because they will bring in viruses;
- if there are sick chickens or if we are concerned that there is an outbreak of infection, we must keep them in a separate chicken house ;
- do not eat or sell sick chickens – bury or burn them;
- prevent chickens traders and other people from entering the premises and the chicken house ;
- vaccinate chickens regularly and use properly (vaccines).
- Monthly, deworm from the body of 3 week old chicks. Deworming helps chicks to be strong and grow quickly; especially it protects them from diseases.



### 4.3 CHICKENS VACCINATION PROGRAM

Table of chicken vaccination program

Option 1: Suitable for brooding chickens		
Age (days)	Vaccines	Administrations
9	Newcastle F or B1	drop in chicken eyes or nose
10	Pox	inject in wing skin
20	Newcastle F or B1	drop in eyes or nose
40	Newcastle Lasota	mix with water
+60	Newcastle M	inject in muscle

Option 2: Suitable for meat chickens		
Age (days)	Vaccines	Administrations
5	Newcastle I 2	drop in chicken eyes
10	Pox	inject in wing skin
+45	Cholera	inject in muscle



Picture 28 Vaccination

#### 4.4 PREVENTION AND TREATMENT

Chickens diseases such as pox, diarrhea, and roundworms can be treated with natural medicines. However, other diseases which are caused by viruses cannot be treated. Therefore, most chicken raisers focus on the use of vaccines for regular and proper use to prevent disease.

In order to keep chicken body in normal temperature during dry season farmers can use some traditional medicines such as lemon grass base, kapok bark, neem bark, neem leaves, Guduchi, Phyllanthus amarus, bitter leaf, Careya sphaerica bark, ginger, white onion base. Any type of medicine can be used, which is locally available by soaking them in water for chickens to drink regularly.

Example: Use 2 finger-width/hand-sized kapok bark, neem bark or 2 stems of lemon grass and then soak them with 2 litres of water and let chickens drink. Also, we can use a handful of neem leaves or bitter leaves chopped and mixed with 1 kg of feed and for chickens to eat daily.

Farmers also can use others natural materials to produce the traditional medicine for releasing the worm of chicken such as Sangke seeds or leave/seed of Kantom Thet or young Sla fruit by grinding them to mix with food or put them in water or feed chicken directly (1 kg of chicken uses Sangke seed or 3 seeds of Kantom Thet, but the young Sla fruit takes only 1/8. Keep doing this for 3 days every month or until the chicken does not have worm.

During the chick hatchery, the farmers have to protect the hens from an insect called Sromeul by using the tobacco or neem leave or the trunk of wild rumbutan to lay it at the bottom of eggs storage because its smell can keep the insects away. The Sromeul can make the chicken's health worse by absorbing the blood, and it is a disease spreader during the hatchery which means that hens are difficult to hatch and the chicks will die after they are born.

To attain high yield in raising chicken, the following key points should be followed:

- ❖ Select a good species of chicken, without infection and not inbred, and do not keep the same mother hen for breeding again;
- ❖ Set a fence around the chicken raising premise;
- ❖ Increase tree shade and grow shrubs for chickens to take shelter, and water the shrubs frequently especially in the dry season;
- ❖ Build a pen for chickens to sleep and lay eggs;
- ❖ Provide clean water for chickens every day;
- ❖ Avoid feeding chickens with only one kind of feed;
- ❖ Add more types of feed using vegetable (for example, rice bran mixed with water convolvulus or duckweed) and occasionally mixed with meat for your chickens to eat;
- ❖ Dig a hole for making chicken's compost to attract insects as additional feed for your chickens;
- ❖ Periodically mix traditional medicines with feed or water for your chickens to eat and drink;
- ❖ Regularly prevent mite presence in your chicken nests;
- ❖ Examine and periodically turn chicken's eggs when your mother hen starts incubating her eggs.
- ❖ Enclose the baby chicks with their mother for at least 15 days and let them drink water mixed with ginger and garlic every day;
- ❖ Always keep the chicken raising premise clean.

## LIST OF PICTURES

<b>Picture</b>	<b>Title</b>	<b>Source</b>
Picture 1	Kandong	VVOB ImAgE 2010
Picture 2	Sampov	Mr Thea Savuth (Department of Agricultural Extension Kandal)
Picture 3	Kragnas	VVOB ImAgE 2010
Picture 4	Skoeuy	VVOB ImAgE 2010
Picture 5	Samley	VVOB ImAgE 2010
Picture 6	Bantam	VVOB ImAgE 2010
Picture 7	ISA Brown leuncone	VVOB SEAL 2012
Picture 8	Chicken cage for reproduction	VVOB SEAL 2011
Picture 9	Egg growth	Copyright © CEDAC 2011
Picture 10	Steps of Chicken growth	Copyright © CEDAC 2011
Picture 11	Chicken house with fence	Mr Thea Savuth (see above)
Picture 12	Chicken house aligned with the sun	Mr Thea Savuth
Picture 13	Chicken house on raised grounds	Mr Thea Savuth
Picture 14	Chicken house on raised grounds	Mr Thea Savuth
Picture 15	Chicken house on poles	Mr Thea Savuth
Picture 16	Double-room chicken house	Mr Thea Savuth
Picture 17	Chicken cage for brooding	Mr Thea Savuth
Picture 18	Chicken cage for temporary separation	Mr Thea Savuth
Picture 19	Shelves for sleeping and laying eggs	Mr Thea Savuth
Picture 20	Nest for laying	Mr Thea Savuth
Picture 21	Commercial chicken raising	
Picture 22 a-i	Plants for producing natural chicken food	Copyright © CEDAC 2011
Picture 23	Azolla/duckweed	VVOB SEAL 2012
Picture 24	Feeder for chicken	Mr Thea Savuth
Picture 25	Wooden food storage	Mr Thea Savuth
Picture 26	Drinker for chicken	Mr Thea Savuth
Picture 27	Drinker for chicken	VVOB SEAL 2011
Picture 28	Vaccination	VVOB SEAL 2011

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