poultry production: low cost technology

SIMPLE SHELTERS FOR NATIVE CHICKENS
Location: Taiwan, ROC

Technical description

Native chickens have a number of useful characteristics, including the ability to thrive on coarse feeds, resistance to diseases, and lower nutrient requirements. A framework of a simple shed can be made of bamboo cane or tree trunks, with a roof of rice straw or lalang grass (Imperata cylindrica) (Fig. 1). Chickens can rest at night and on rainy days under shelter. A cardboard box, with dried weeds or rice straw inside, can be put under a tree, about 20cm from the ground, as a nest. Discarded containers such as tin cookie boxes with a stone inside are used as feed troughs and water containers. Feed troughs can also be made of wood.

The feed and water troughs are placed in the shade, and adjusted to the height of the chickens. The number of nests, feed, and water troughs should be sufficient. It is better to choose a feeding place where there is good drainage.

In addition, shrubs and weeds around the feeding area will provide places for chickens to rest and look for feed. Grain and by-products should be supplied when feed is not sufficient. It is better to fence the feeding area with bamboo cane, rice straw or Lalang grass.

Uses and merits

In places where electric power for an incubator is not available, or in less developed areas where there is a shortage of vaccines and commercial feeds, farmers should choose native chickens that brood, are climate-tolerant and disease resistant. It will be easier to get a good number of chicks and a high rearing rate.

Chicken houses can be constructed on barren land. Insect, weeds, leaves, kitchen leftovers, broken grain, and grain by-products can be used as feed. Chicken production of this kind not only improves the fertility of the land but also minimizes production costs. It gives local residents a supply of animal protein.

Reservations on its use

Farmers using simple shelters for native chickens should pay attention to the repair of the shed before the rainy season, to prevent the chickens from getting wet. In winter, it is better to build a fence made of rice straw or bamboo, etc., to protect the chickens from wind. Litter in the nest should be kept clean and replenished as necessary.

Expert’s comments

The number of nests should be sufficient to assure good incubation. Rice bran or hay should be supplied from the beginning of laying to provide nesting materials for the layer. The appropriate ratio of males and females is 10:1. The chicks after hatching should be kept warm, and prevented from getting wet in the rain.
Framework of simple shed is of bamboo cane or tree trunks. The roof is covered with rice or wheat straw, reeds, etc., so the chickens can rest underneath in the shade.

Perch made of bamboo canes or tree trunks

Cardboard box containing dried weeds or rice straw is put under the shade of a tree, about 20 cm from the ground as a nest.

Fig. 1. Simple shelters under tree for native chickens.
AGRICULTURAL BY-PRODUCTS AS FLOOR LITTER FOR DUCKS
Location: Philippines

Technical description

By-products such as rice hull, corncobs, peanut hulls, and sugarcane bagasse can be used as floor litter in duck production. They are commonly placed inside the sheds where the birds feed and lay eggs (Fig. 2). The litter is spread out to cover the ground with a layer about 3-4 inches thick. As the litter becomes soggy with moisture after several days, it is removed and additional litter is spread.

Uses and merits

Crop residues used as floor litter keep the living environment of the birds dry and help prevent the spread of pests and diseases. The litter materials also serve to cushion the eggs, minimize breakage and keep the ground covered. Thus, the litter promotes the collection of clean eggs, which command a higher price. Also, the used litter when collected can be spread in the field as organic fertilizer.

Reservations on its use

Once the litter becomes soggy with water, immediate replacement is needed. Otherwise it becomes a very effective medium for the spread of diseases. Disposal of used litter can also be a problem. With the use of litter, some eggs may be left uncollected because birds have the tendency to cover their eggs once laid.

Fig. 2. Agricultural by-products used as floor litter for ducks.

Rice hull, corn cobs, etc. are often used as floor litter in duck production.
CAGE FOR NATIVE CHICKENS
Location: Buriram Province, Thailand

Technical description

Strips of bamboo approximately 1 cm wide and 0.5 cm thick are used to construct a hemispherical net shape with a large hole in the top (Fig. 3).

Uses and merits

The fundamental behavior of chickens (scratching for food) is not restricted. The cage is usually used to keep a fighting rooster in, or a hen with its young brood. The chicks are free to run in and out of the cage.

The bamboo cage is placed on the ground with the chickens inside, so that the chickens are able to scratch on the ground. Mating of specific individual chickens can be controlled when the cage is used.

Reservations on its use

Feed and water must be provided at all times. The large hole at the top of the cage must be plugged with a discarded bowl with a brick in it.

Expert's comments

The cage with a chicken inside should not be left in the hot sun. It is best used in shady areas.

Fig. 3. Bamboo cage for native chickens.
PANDAN BAGS FOR INDIVIDUAL TRANSPORT OF POULTRY
Location: Philippines

Technical description

Avery popular indigenous material for weaving handicrafts like handbags, mats, transport bags and hats is pandan (family Pandanaceae, genus Pandanus). Also known as crew pine, pandan is a tropical shrub found in the Philippines that varies from one meter to more than 15m in height. This plant grows in backyards, along coastal shores, and in elevated areas. In moist places, the plants grow naturally under coconut.

Immediately after harvest, the pandan leaves are cut and stripped to the desired size then sun-dried for 3 days. The leaves are pre-pressed to improve the quality and prevent wastage. A heavy round log is commonly used as a press. The flattened leaves are then woven into coarse or fine baskets or bags (Fig. 4).

The pandan bag is commonly used for transporting individual native chickens, especially fighting cocks. However, other poultry such as ducks, geese, and fowls can also be transported using this bag. Holes are made on both sides of the basket to allow ventilation. The bags are hand-carried, or can be loaded onto trucks, boats, etc. When the bags are well woven and sturdy, they can carry relatively heavy weights. Containers of this kind are also used to carry vegetables, fruits, meat, fish, etc. The bag can be re-used, and lasts a long time it stored properly.

Uses and merits

As a means of carrying and transporting poultry like chicken, game fowls, ducks, etc. the pandan handbag or basket is quite popular. One person can easily carry several bags. It is durable, and at the same time cool, since it is made of natural materials. The bag is also cheaper than conventional boxes.

Reservations on its use

The pandan bag can allow only one mature bird per bag. Being made of light material, the bag can easily be trampled on, endangering the bird inside.

Expert's comments

The bag is good only for short distance travel, in view of the limited space inside.
PERCH FOR NATIVE CHICKENS
Location: Buriram Province, Thailand

Technical description

Two wooden posts (A) are secured to the ground and a piece of bamboo (B) is fastened to them. A small ladder (C) is then constructed and then fastened to the bamboo (B).

Uses and merits

Native chickens still retain some original behavior of wild fowl. They perch at night on branches of trees or bamboo.

The perches are usually placed inside a chicken house (Fig. 5). The native chicken will climb the bamboo ladder and perch on the long piece of bamboo for the night. This will improve the hygiene of the chicken as well as provide some protection from predators such as snakes.

Reservations on its use

The perches should be placed on one side of the chicken house. The space on the perch should be sufficient for all chickens to prevent competition for space at dusk. Sharp splints and projections on the bamboo should all be removed to prevent injuries.

Expert’s comments

The long bamboo should be rigid enough to withstand the weight of the chickens. They do not like to perch on swaying bamboo.

Fig. 5. Perches for native chickens in Thailand.
BAMBOO BROODER FOR DUCKLINGS
Location: Taiwan, ROC

Technical description

It is important to keep ducklings warm in the first week, especially during the first two days. A bamboo brooder is used to raise duckling without electricity. A brooder is like an inverted lid placed on the ground, into which rice hull for litter is placed. There is an open window at the top of the brooder, used to put in the feed and for cleaning.

The top of the brooder is covered with sacks at night to keep the ducklings warm (Fig. 6). Inside the brooder, humidity is very high because the brooder is covered with a sack. It is necessary to move the brooder to a dry area at night to keep the ducklings’ feathers clean. If the outside temperature is not below 20°C, the bamboo brooder is an easy way to keep ducklings in good condition.

Uses and merits

The bamboo brooder is easy to operate and cheap. In the absence of electricity in rural areas, the brooder is convenient for raising ducklings. It is also easy to set up and transport.

Reservations on its use

The climate must not be too cold. The brooder is used only if ambient temperatures are above 20°C.

Expert’s comments

Thirty ducklings are recommended per brooder. A common diameter for a brooder of this kind is 70cm. All ducklings can be raised together after two weeks. It is necessary to clean the brooder and dry it in the sun after brooding is finished.

Fig. 6. Bamboo brooder for ducklings.
NEST FOR NATIVE CHICKENS
Location: Burirum Province, Thailand

Technical description

Strips of bamboo are used to weave a conical basket. Rice straw is then put inside the basket, and pushed down into a nest shape (Fig. 7).

Uses and merits

In raising native chickens, usually nests are provided in the chicken house where layers will incubate their eggs.

The nest is hung from the wall of a chicken house, or from any solid post, with the lower end secured tightly to the wall or the post. A layer will come to inspect the provided nest, and usually decide to lay its eggs there.

Fig. 7. Nest for native chickens in Thailand.
MULTIPLE NESTS FOR LAYING DUCKS
Location: Nakorn Phathom Province, Thailand

Technical description

Bamboo partitions with two-end posts (A), inner posts (B), and bamboo rails (C, 2-3 cm width) are placed upright and parallel (Fig. 8). The earth is scooped out in a shallow dish and dry rice straw is placed inside it.

Uses and merits

Large numbers of laying ducks will tend to lay their eggs in the same period at dawn. Although enough individual nests are provided, only some will be occupied by a number of laying ducks, leaving others empty.

This simple contraption is used as a multiple nest for a flock of laying ducks. It will alleviate the problems of soiled eggs to a certain extent.

Reservations on its use

All sharp edges on the bamboo structure must be removed to prevent injuries. Any nesting materials that become wet, especially rice straw, must be replaced at once.

Expert's comments

The nests must be protected from rain and sun, especially rain which can soak the nest.

![Figure 8](image_url)

Fig. 8. These simple nests allow ducks to lay clean eggs and can accommodate a number of birds at the same time.
PRODUCING LOW-FAT CHICKENS BY FEEDING CHILI PEPPER SEEDS
Location: Kyoungbuk Province, Korea

Technical description

Seeds from fully ripened red chili peppers are collected and thoroughly dry. Seed containers are provided on the ground and separated from grain feed troughs. Fowls are allowed to feed freely on the chili seeds.

Uses and merits

Hot pepper seeds reduce the fat content of poultry meat and increase its flavor. These changes can usually be observed after two months of feeding chili seeds.

Expert’s comments

The National Livestock Research Institute, Korea plans to carry out an experiment on chili pepper seeds as a supplementary feed for broilers. An increasing demand for low-fat livestock products is a recent trend in Korea.
MIXING SAND IN FOWL FEED
Location: Korea and elsewhere

Technical description

Clean, fine sand is added to the grain feed of fowls. The amount of sand added is up to 3% of broiler feed and 4% of layer feed (Fig. 9).

Uses and merits

Fowls have ventriculi (muscular stomachs) for physical digestion. Poultry farms are becoming large and more commercialized, so that farmers are raising their fowls in poultry houses instead of backyards. The birds do not have access to ground where they can scratch and peck.

Sand improves egg production by 3%, and reduces feed cost of layers by 4%. Sand increases the eight-week body weight of broilers by 4%, and reduces feed costs by 9%.

Expert’s comments

Korea’s National Livestock Research Institute proved the effectiveness of the sand-added fowl feed through 1986 - 1987 experiments. The amount of the sand added to grain-feed is adjustable according to the layer’s egg production ability.

Fig. 9. Adding sand to grain given as poultry feed improves egg production and reduces feed costs.
PASTURING DUCKS IN RICE FIELDS
Location: Philippines and elsewhere

Technical description

The practice of many duck raisers in the region is to let loose the flock in newly harvested rice fields, to eat on the fallen grains, weeds, and other natural food (Fig. 10). A makeshift shed is put up in the field for the birds’ shelter and to lay eggs in.
A caretaker, usually a child, looks after the birds while they are out in the field, and collects any eggs early in the morning. After a certain period, the birds are transported in improvised trailers to other newly harvested fields.

Ducklings are also let loose in established rice fields. They are allowed to feed on weeds, and on the apple snails that are often common at this stage of rice growth. Since the ducklings are small, the newly established rice plants are not likely to be trampled. When the birds are 4-5 months old, they are kept in confinement and fed on duck layer pellets and snails in preparation for egg production.

Uses and merits

The practice of grazing ducks in rice fields, be it in newly harvested or newly planted areas, gives the birds access to natural and nutritious feeds, including snails and insects that are otherwise harmful to crops. Ducks also help control the dreaded apple snails, which are disastrous in newly planted rice. Ducks’ manure excreted in the field is added fertilizer for the crop. Grazing the birds in the field saves the farmer feed costs.

Reservations on its use

Letting the birds loose in the field, particularly in irrigation canals or water-logged paddy, poses the danger of chemical poisoning. In rice fields, farmers commonly apply insecticides and herbicides to protect the crop. Hence, if ducks swim in irrigation canals, poisoning accidents can occur, particularly if farmers upstream clean their sprayers or dispose of unused chemicals in the canal. Grazing should be limited to established rice fields.

Transferring ready-to-lay birds or layers from one site to another is strenuous, and can adversely affect the ducks’ laying performance.

Expert’s comments

Giving the ducks access to natural foods in the field is a healthy practice. Giving the birds extra concentrates will ensure the desired nutrient intake necessary for growth and reproductive development in preparation to laying. Ready-to-lay birds should be completely confined and should not be allowed to graze in the field. The transfer should be made before the ducks start laying.

Fig. 10. Pasturing ducks in rice fields gives them access to natural and nutritious feeds.
SIMPLE HEATER FOR YOUNG CHICKS
Location: Taiwan, ROC

Technical description
The newly hatched chick needs a high critical temperature of 36-38°C. It is necessary to provide extra heat, when temperatures are low, to keep the newborn chicks warm. Traditionally, gas lamps are used as a heat source. However, chicks will chill if the gas lamp runs out of gas. Gas leakage may also occur.

Electric bulbs can be used as substitutes for the gas lamp. The efficiency of the light bulb will be improved if an umbrella covering made from cardboard is used (Fig. 11).

Uses and merits
The use of an electric bulb can avoid gas intoxication when gas leaks occur. It is low-cost and simple equipment, which is safe and easily operated.

Reservations on its use
The electric light bulb must be located in a dry, clean area so it does not get wet. If an electric bulb is used, it is important to adjust its height to optimize the heat. An insulating material must be placed between the electric wire and cardboard umbrella to avoid drafts and wind.

Fig. 11. The use of an electric bulb as a heat source avoids the intoxication that can occur with gas-fueled heaters.
**BALLOON BIRD EXPELLER (SCARY EYES)**

Location: Taiwan, R.O.C.

**Technical description**

The balloon bird expellers have three different colors. They are hung underneath the eaves of poultry houses, usually around 10m apart. The life span of the balloons is around one year (Fig. 12 and Fig. 13).

**Uses and merits**

Intruders such as sparrows or other birds are a nuisance in poultry houses. They not only bother the chickens and carry diseases, but also waste feed and cause environmental pollution. The application of the bird expeller is more effective than the bird network.

The expeller is a low-cost and convenient instrument, which is replaceable. It can achieve the bird expelling effect if the expellers are replaced as scheduled.

**Reservations on its use**

It is important to install balloon expellers with different colors, changing them frequently. The balloon bird expellers will shrink within one month, hence they need to be refilled with air. Timely cleaning is needed because it is easy to get dirt on the balloon expeller surface. It is critical to avoid any sharp or iron wire that can prick the balloon.

**Expert’s comments**

The balloon bird expeller will not only get rid of the intruding birds but make the chickens uneasy. It must be hung in an appropriate location to avoid frightening the chickens. Balloons with scary eyes could also be used to keep away birds from crops or orchards.

Fig. 12. Balloon bird expeller (scary eyes)  
Fig. 13. Balloon bird expeller (scary eyes)
TERMINATION OF PHEASANTS’ CANNIBALISM

Location: Central Chonbuk Province, Korea

**Technical description**

Ping-pong balls are scattered on the ground of the pheasant roost. One ping-pong ball for 10-15 pheasants is recommended.

**Uses and merits**

Raising pheasants, which are not as domesticated as other poultry, is a new farming practice in Korea. Ping-pong balls that resemble pheasant eggs are used as they cannot be broken by pecking. After pheasants have pecked the ping-pong balls, they are discouraged from pecking eggs or each other (Fig. 14).

Hence, this practice helps reduce cannibalism such as pecking at the eggs and fighting, and increases the number of eggs collected during the egg-production season.

![Fig. 14. Ping-pong balls discourage pheasants from pecking eggs.](image-url)