A MANUAL ON FOOD BASED NUTRITION
FOR
SMALL SCALE POULTRY PRODUCERS

Improving Food Security of Women and Children by Enhancing Backyard and Small-scale Poultry Production in the Southern Delta Region

USAID
FROM THE AMERICAN PEOPLE

Trainers Manual on Selected Topics in Food Based Nutrition and Trainer's Guide for Training Facilitation
Compiled under the "Improving Food Security of Women and Children by Enhancing Backyard and Small-scale Poultry Production in the Southern Delta Region (GCP/BGD/048/USA)

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Table of contents:

Trainer's Manual

Hygiene and Sanitation (30 min)

Learning objectives:

- **To understand why hygiene is important to prevent diseases**
- **To understand what are the critical points when washing hands and why it is important**
- **To learn the 6 steps of effective hand washing**
- **To learn how to install a tippy-tap: a handy and cheap solution for hand washing**
- **To understand most important points for keeping the household and its surroundings clean and hygienic**
- **To understand the principles of hygienic food preparation**
- **To understand the principles of hygienic food and water storage**

Hygiene and Diseases

Hygiene refers to conditions and practices that help to maintain health and prevent the spread of diseases. It therefore includes a set of practices associated with the preservation of health, for example hand washing, environmental cleaning, water and sanitation and safe disposal of household waste.

Lack of good hygiene causes diseases and illnesses

What makes us sick?

Germs and dirt

Germs are small organisms which grow on dirt, especially if the dirt contains food leftovers, animal or human feces. Germs grow also on human body, especially in the nose, mouth, nails and on animals. Whenever we touch something we leave our germs on it and germs from its surface stay on our hands.

A clean house and living area is required to reduce number of germs and let us be healthy.

What happens when germs get into our food?

Germs make us sick because they get into our food and we eat them.

When we eat food that has germs we can get food poisoning: we get stomach ache, have fever, feel weak, lose appetite and often we get diarrhea and we vomit.
When we get diarrhea and vomiting: we lose nutrients, body salts and water and we cannot eat.

- **Children become undernourished and they stop growing**
- **Adults are tired and cannot work**
- **Children can't go to school and learn**
- **Small children require more attention, cannot sleep ad often cry**

More than half of all illnesses and deaths among young children are caused by germs that get into their mouth through food, water or dirty hands. These illnesses, especially diarrhea, can be prevented by good hygiene practices.

Most common sources of food contamination by germs causing food poisoning:

- ***Fingers of a person who prepares food – CAN BE PREVENTED BY HAND WASHING***
- ***The toilet, and dirty hands***
- ***Livestock and livestock faces***

} **CAN BE PREVENTED BY KEEPING HOUSEHOLD CLEAN**

- ***Poultry meat and eggs***
- ***Other meat***
- ***The soil on vegetables***

} **CAN BE PREVENTED BY SAFE FOOD HANDLING**

- ***Food which was stored in room temperature between meals***

} **CAN BE PREVENTED BY PROPER STORAGE AND REHEATING FOOD**

- ***Water - CAN BE PREVENTED BY USING WATER FROM SAFE SOURCES***

Be clean and keep your household and its surrounding clean

Good hygiene protects you and your family against diseases

Hand washing

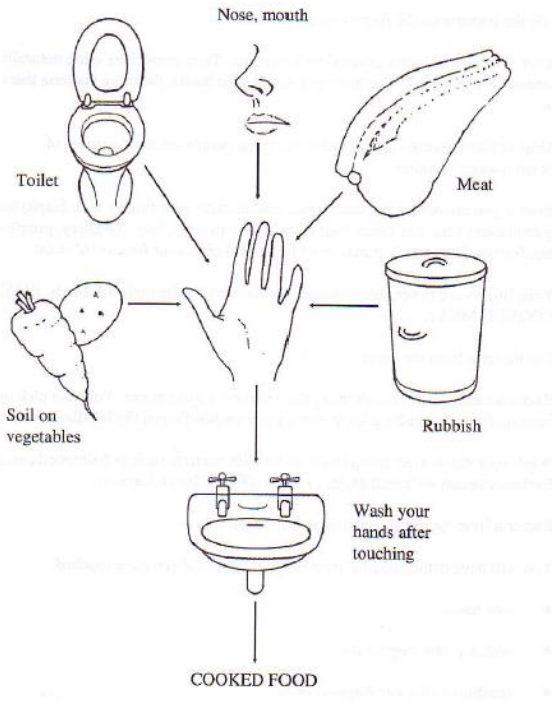
Dirty hands are the most common source of food contamination. Washing hands before cooking and eating and after the critical activities will eradicate the frequency of suffering from food poisoning by all family members.

Wash hands with clean water and soap or ash especially after:

- *Going to the toilet or cleaning a baby's bottom;*
- *Washing dirty bed linen or surfaces contaminated with feces;*
- *Handling animals;*
- *Before and after preparing food and eating;*
- *Before feeding a child or sick person.*

Pic. 22: washing hands with soap and water

Keep soap and water at three critical places (cooking area, feeding and eating area and latrines)



Source: Advanced Food Safety Ltd. Intermediate Food Safety (New Level 3) Distance learning Course. Module 3

Sources of dirt and bacteria on our hands

6 steps of hand washing

Washing hands with soap should last for minimum 20 seconds

Hand washing comprises of six steps which are as follows:

1. *scrub palms,*
2. *back of hands,*
3. *between fingers,*
4. *finger tips,*
5. *thumbs and*
6. *wrists and fingernails*

Pic. 2: Six steps of hand washing

Once hands are scrubbed thoroughly, rinse both sides of hand with water and wipe hands with a clean and dry towel.

Keep your nails always short, germs grow under nauls where dirt acumulates and it is hard to wash them out from there.

Making a tippy tap:

Installing a tippy tap is a simple and cheap way of ensuring that you can easily wash hands in critical places: **near the latrine, eating area, food preparation area and poultry and livestock sheds**.

To build a tippy tap we need:

- ***A clean plastic bottle***
- ***A rope or string***
- ***A small knife or a nail***
- ***A candle***
- ***Matches***
- ***A soap***
- ***If possible a net bag***

Pict. Equipment needed to build a tippy tap
Source: SPRING promotion materials – How to Build Your own Tippy Tap

The procedure:

1. Heat up the knife or nail over the candle and use it to make a hole in the side plastic bottle, low and close to its bottom.
2. Fill the bottle with water and close the cap tight and tie the bottle to the pole with strings. Place tippy taps near to the critical areas: Latrine, food preparation and eating areas.
3. Hang soap in a net next to each bottle.
4. Open the cap slightly and the water will come out through the hole.
5. Wash your hands with water and soap

Pict.A tippy tap installed on a tree
Source: SPRING promotion materials – How to Build Your own Tippy Tap

Pict.A girl using a tippy tap
Source: SPRING promotion materials – How to Build Your own Tippy Tap

Household Hygiene:

In the homestead area the main sources of germs which can cause diseases are:

- **Homestead waste**
- **Human feces**
- **Animal feces**
- **Domestic animals**

Remove household waste and dirty water from the homestead area:

- *Always dispose off rubbish in a pit and cover it.*
- *Do not let rubbish build up – it can be a source of cross-contamination*
- *Household waste water can be disposed off safely by making a soak pit or a channel to the field or an area outside the house.*

Remove human and animal feaces from the homestead area

- Clean up animal feaces lying around to protect children from coming in contact with them
- *If it is not possible to use a toilet or latrine, everyone should always defecate well away from residential areas, houses, paths, water sources and children's playing area. The faeces should be buried immediately.*
- *In case of dirtying clothes with faeces wash them and rinse with clean water and then keep in boiling water for 5 minutes.*

Keep livestock away from home and ensure clean and hygienic sheds

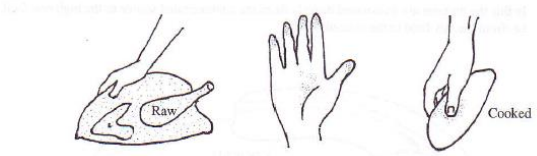
- *Make sure livestock sheds are well ventilated*
- Clean livestock sheds and remove waste regularly
- Wash your hands thoroughly after touching animals or working around the sheds

Handle your foods safely

Separate raw meat, poultry, eggs and seafood from other foods

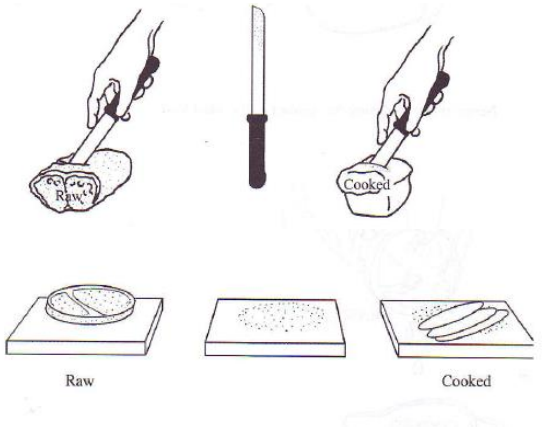
Source: Advanced Food Safety Ltd. Intermediate Food Safety (New Level 3) Distance learning Course. Module

Never let raw meat touch or drip into cooked meat



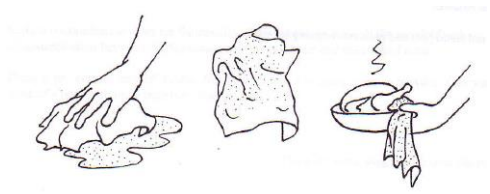
Source: Advanced Food Safety Ltd. Intermediate Food Safety (New Level 3) Distance learning Course. Module 3

Wash your hands before touching cooked food



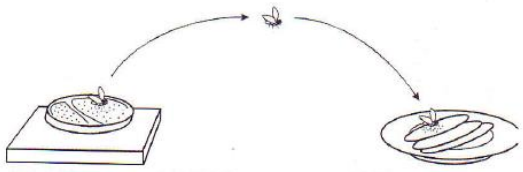
Source: Advanced Food Safety Ltd. Intermediate Food Safety (New Level 3) Distance learning Course. Module 3

Wash kitchen equipment and surfaces after using them for raw meat and before using them for cooked food



Source: Advanced Food Safety Ltd. Intermediate Food Safety (New Level 3) Distance learning Course. Module 3

Dirty clothes are source of germs



Source: Advanced Food Safety Ltd. Intermediate Food Safety (New Level 3) Distance learning Course. Module 3

Protect food from flies and pests to avoid contamination with germs from other places

Any person who is sick or is still recovering from a recent sickness should not be involved in food preparation. This is to avoid food contamination from the sick person.

Poultry meat should be always well cooked.

- **Poultry is a key source of germs responsible for food poisoning if it is not handled or cooked properly. Poultry meat contains germs both on its surface and inside body.**

How to recognize that chicken meat is sufficiently cooked?

Stick a knife into the thickest part of the meat that is being cooked down to the bone (base of the chicken leg is the part with the thickest meat layer). If the juices that come out are tinged pink with blood, the chicken needs more cooking. When the chicken is cooked the juices should be quite clear and the meat should come out of the bones easily.

Sick, dying or dead animals should NOT be consumed; do not eat meat which contain lumps, does not look normal or has an unusual smell.

Don't slaughter birds which appear sick

Store foods safely

Food can easily get contaminated with germs during storage. It is important to store it safe to avoid contamination which can cause a food poisoning.

Cover foods with lids or a clean cloth to protect them from insects, pests and dust.

Keep dry foods such as flours and legumes in a dry, cool place where they are protected from insects, rats and mice, and other pests.

Reheat all cooked foods in a high temperature (boiling) just before serving

Use only safe water

- Use clean and safe water
- *Use safe water, such as treated pipe water, green tube well (arsenic free) or water from a protected source, such as a borehole or protected well (bathing and washing does not take place and the water is not contaminated).*
- Water from unsafe sources such as ponds, rivers, open tanks and step-wells can be made safer by boiling rapidly for ten minutes.
- *Use clean and covered containers to collect and store water.*
- *Never put food or water in empty containers that have been used for chemicals/pesticides.*
- *Don't touch clean water with unclean hands, use only clean cups to take water from the container.*
- *Keep animals away from drinking water sources and the household area.*

Wrong practice **Right practice**

Pict. 11: Methods of storing water

Basic food and nutrition (20 min)

Learning objectives:

- To define what is a balanced diet
- To understand the basic food groups and their functions in the body
- To understand the foods that are a part of the three food groups that contribute to a balanced diet

Balanced diet

A balanced diet provides the correct amounts of energy and nutrients needed during the day to cover the dietary requirements of the person eating it. A balanced diet must be composed of a variety of foods from different food groups so that it contains all the macronutrients and micronutrients that a person needs.

No single food provides all of the nutrients needed for health and strength of our body. We need to consume a wide variety of different foods every day.

Introduction

A healthy and balanced diet:

- Provides energy to perform work and other functions such as breathing, digesting food, and keeping warm;
- is essential for growth;
- protects the body against illness (keep healthy).

To have a balanced diet meeting all the nutrient requirements, you should mix foods from three basic food groups that are classified according to their function:

- **Energy giving foods;**
- **Body building foods;**
- **Protective foods.**

The three different food groups that contribute to a balanced diet

1. Energy giving foods

Energy foods give energy to work and help children to grow. This group includes foods rich in energy like cereals, roots and tubers, sugar, oils, butter and ghee.

Table 1: Local energy giving foods

Cereals	Roots and Tubers	Fats/Sugar
Rice (Chal)	Potato (Alu)	Ghee (Ghee)
Maize / Corn (Vutta)	Sweet Potato (Mistialu)	Butter (Makhon)
Wheat (Gama)	Beetroot (Beet)	Oil (Tel)
Barley (Jab)	Turnip (Shalgam)	Sugar (Chini)
Rice Flakes (Chira)	Yam(Mateyalu)	Jaggery (Gur)
Semolina (Suji)		Coconut (Narikal)

2. Body building foods

This group includes foods which build our body and give us strength, help children to grow. These foods are also important for blood building to avoid aneamia and for bone building.

Table 2: Local body building foods

Pulses/Legumes	Nuts and oilseeds	Milk and Products	Flesh foods
Lathyrus (Khesari)	Groundnut (Badam)	Milk (any)	Chicken (Murgi)
Chick pea (But)	Sesame (Til)	Curd (Dahi/Doi)	Meat (Mangso)
Green gram (Moong)	Pumpkin seed	Cheese (Paneer)	Fish (Mas)
Lentils (Massor)	(Mistikhumrabichi)	Buttermilk (Ghol)	Egg (Dim)
Black Gram(Mashkolai dal)			

3. Protective foods

Protective foods are important part of the diet because they protect us from infections by giving immunity. They also help maintain body functions like build blood and keep children's eyes healthy.

Table 3: Local protective foods

Vegetables	Fruits	Leafy Vegetables
Tomato (Tomato	Mango (Aam)	Spinach (Palongshak)
Pumpkin (Misti kumra)	Papaya (Pape)	Red Amaranth (Lalshak)
Carrot (Gajar)	Pineapple (Anaras)	Colocasia leaves (Kochushak)
Okra (Derosh)	Dates (Khejur)	Mint (Pudina)
Bottle gourd (Lau)	Jackfruit (Kathal)	Sarisashak (Mustardl)
Ridge gourd (Jinga)	Sapota (Sofeda)	Amaranth leaves (Data shak)
Ash gourd (Jalikumra)	Wood apple (Bel)	Drumstick leaves (Shajnashak)
Snake gourd (Chichinga)	Hog Plum (Amra)	Indian Spinach (Puishak)
String bean (Barbati)	Aonla (Amloki)	Bottle gourd leaves (Lau shak)
Beans (Sheem)	Jambu (Jamrul)	Radish leaves (Mula shak)

To stay healthy, one should eat foods from each of the three food groups, and at least two different foods from each food group on a daily basis

The role of poultry in nutrition (20 min)

Learning objectives:

- **To understand how poultry contributes to nutrition of the household**
- **To be able to identify the advantages of rearing poultry as a source of household food security**

Poultry can make many positive contributions to the diet of those on low incomes. Chicken meat and eggs are a good source of high quality protein and bioavailable micronutrients. Poultry meat is also an important provider of fatty acids that are beneficial to health. Small scale poultry plays a critical role in household food security by increasing the consumption of egg and meat by the household members and enhancing income generation opportunities

Advantages of rearing poultry:

- *Poultry is a readily available source of nutritious foods for the household: meat and eggs;*
- *One chicken provides a meal for an average family without the need of storing leftovers;*
- *Eggs can be sold directly or stored without a risk of spoilage (if stored properly in a cool dry place;*

Chicken produce: meat and eggs are highly nutritious foods which should be included in the diet

- *Chicken meat especially liver is a rich source of iron which is important in blood building and anemia prevention.*
- *One egg is almost a meal in itself providing high quality protein and micronutrients – it is a perfect snack for children and adults;*
- *Adding a small amount of meat to a meal will improve the nutritional quality and enhance absorption of micronutrients from other foods consumed in the meal.*

How to store eggs

Eggs can be stored for weeks before selling or consumption

Table 1. Approximate safe storage times for eggs

Type of storage	*Approximate length of storage*
Eggs with broken shell	*Use immediately and do not store*
Fresh eggs (fertile and infertile) stored in warm conditions (above 20°C)	*1-2 days. If unsure about the age of the eggs, test to see if they are spoilt and hard boil or cook them well before consumption.*
Fresh eggs (fertile and infertile) stored in a cool, shaded place	*5-7 days*
Oiling egg on the day of lay and kept in cool, shady conditions (use cooking or vegetable oil)	*2 weeks*
Hard boiling eggs on the day of lay	*3 weeks*
Hard boiling and oiling fresh eggs	*4-5 weeks*
Refrigeration (where temperature is constantly maintained around 4°C)	*4 weeks*

Source: Australian Center for International Agricultural Research: Improving village chicken production: a manual for field workers and trainers. Australia, 2009

How to distinguish fresh egg from old eggs

Place eggs in a container of water. Old eggs, which may be bad and which should not be eaten, will float in the water because of a bubble-like chamber of the air (the air cell) inside the egg gets bigger with the age of egg (see Figure 1). This air chamber is smaller in fresh eggs, which will therefore stay at the bottom of the container field with water.

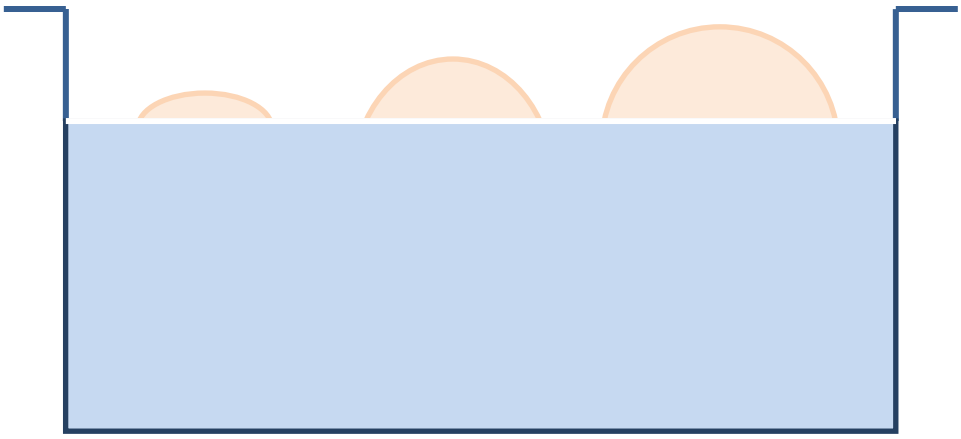


Figure 1. The freshness of whole eggs can be determined by floating them in water.

Poultry produce in child and maternal nutrition

Poultry is particularly important for promoting health during pregnancy and lactation and in early childhood when growth and nutritional needs are high

Women have increased needs during pregnancy and lactation. Both these physiological conditions demand a high supply of macro and micronutrients as a woman not only has to support herself, but also has to supply all the necessary nutrients to the growing fetus and young child. In particular, iron is needed for the foetus, building maternal iron stores and for lactation. It is to be especially noted that iron from vegetable products, including cereal grains, is less well absorbed than that from most animal products:
The nutritious parts of a chicken are:

- ***Liver***
- ***Heart***
- ***Eggs***

These parts can supply substantial amounts of protein, fat and micronutrients which are crucial for foetal and child growth and development. These nutrients are often deficient in the women's diet and can lead to maternal anemia, low birth weight and inadequate growth and development of the child.

Liver and heart of the chicken should be served to the women in addition to the meat in her portion of food.

Children need a nutritious diet for their growth and development.

If the diet does not supply all the nutrients needed, a child becomes undernourished which has life lasting consequences in terms of health, ability to work and learn. Eggs and in particular the egg yolk and chicken meat are rich in minerals which may be deficient in the child's diet: iron, zinc, vitamin A, folic acid; they are also a source of good quality protein.

It is important to include poultry meat and eggs in complementary foods for the young child

- *Soft boiled egg yolk from the 6th month of life*
- *Whole egg from the 8th month of life*
- *Well-cooked meat from the 12th month of life*

The micronutrient content of eggs, as well as chicken meat, can be improved by ensuring a healthy chicken feed and diet. The folic acid concentration in eggs can be increased substantially by feeding hens a folic acid enriched diet. One of the methods is feeding to the chicken raw kitchen leftovers of dark leafy vegetables like spinach, mustard (sorishashak), cauliflower and beet greens, beetroot and carrot. This can be done through practicing "Cafeteria System" for poultry, where chickens receive twice a day three types of food: mineral rich food, vitamin rich food and grains.

Antibiotic use in poultry rearing (10 min)

Antibiotics can increase production and reduce loses by controlling diseases and infections in the poultry farms. However, the use of antibiotics has to be strictly controlled to avoid their unintended effect on the consumers and environment.

Strategic use of vaccination and improved husbandry is usually a more cost-effective way of increasing production than use of antibiotics.

The withdrawal time has to be strictly followed when antibiotics are used on birds

Farmers should always follow the instructions on the leaflet of the product when using veterinary antibiotics or if there are still in doubt seek advice from the Upazila Livestock Officer or the local veterinary surgeon.

Withdrawal time is the time from application of the antibiotic to the moment when it is metabolized by the treated bird and disappears from the organism. If the withdrawal time is not respected and the animal is slaughtered when residuals of an antibiotic are still present in its body, they will have an effect on the persons consuming it.

Withdrawal time **DIFFERS** between different antibiotics. It can be found on the leaflet of the product or farmers can ask the upazila livestock officer (ULO) or a veterinary surgeon.

Slaughter animals only after the withdrawal period of the used antibiotics, otherwise the residues may remain in the meat and will affect the person who eats it.

Sell live birds only after the withdrawal period of the used antibiotic to ensure that the buyer will consume antibiotic free meat.

- Antibiotics will not be removed from meat after the death of the animal

Don't sell or consume eggs which were laid within 2 weeks of antibiotic use.

- Antibiotics will be still present in the eggs which are being formatted when the antibiotic is administered and those eggs with antibiotic's residues will be laid for at least two weeks after giving the antibiotic.

Antibiotics remaining in the meat and eggs can have negative effects on our health and that of our families.

Antibiotic residues in the meat can cause:

- Strong allergic reactions
- Harm to the natural beneficial bacteria in the gut of the consumer

Extensive antibiotic use eventually harms livelihoods. It can cause bacterial resistance, meaning that the antibiotic will lose its effectiveness against particular microbes.

If bacteria gain resistance to antibiotics due to their extensive use, it will result in outbreaks of disease which will not be possible to control through antibiotics and which can attack both animals and humans. Both animals and humans will suffer from diseases for which there is no simple cure. People will take longer to recover from such diseases. Eventually they they will lose their productivity, more working days and income.

When using antibiotics remember to:

Dispose safely excess water or feed to which the antibiotic has been added

- This is to prevent contamination of nearby water bodies and the environment.