9. PRODUCTION AND MANAGEMENT OF FOOD FROM ANIMALS

We eat varieties of food in our daily life. Our food habits differ a lot. Some persons prefer to consume food obtained from plants and some from animals.

What are the food items that are obtained from animals? Does they obtained directly from animals or processing is required? We rear a number of animals for food.

Do we get our food only from domesticated animals? List out the food that is obtained from animals? Discuss in groups and tabulate your discussion in your note book.

Animal Husbandry:

Farmers adopt different methods of management for getting better yields in agriculture. In the same way, care is also required in the management of rearing animals. Providing food, shelter, protection and breeding of animals is called 'Animal husbandry'.

Fig. 1 Dairy Form

Since long time, man used animals not only for obtaining food but also for agriculture, transportation etc. The early man realized this and domesticated the wild animals for his betterment.

Do you know the period from which wild animals were being tamed? See the following table.

Name of the animal	**Period of Domestication**
Dog	30,000 – 7000 BC
Sheep	11,000 – 9000 BC
Pig	9000 BC
Goat	8000 BC

- Why did early man domesticate only some of the animals?
- Why did not he domesticated animals like elephant, tiger, lion etc. or birds like eagle and owl?

Discuss in groups about things to be taken into consideration, while domesticating animals.

We domesticate only such animals which are helpful to us. Buffalo, cow etc are reared for milk. Hens, goats, sheep are reared for meat and ox, horse, bulls, donkeys for agriculture and transportation.

We get food from plants. But food production from plants alone does not full fil all the needs of food requirement of the society. Can we get all nutrients required for our body by eating only plant food? So we need food from animals too. Production of food from animals is as important as agriculture in our country.

- Do all the persons who own agriculture fields also rear cattle?

- Is there any relation between agriculture and cattle rearing or animal husbandry?
- Collect the following information from your class.

No. of families in agriculture.

…….....

No. of families in agriculture along with animal husbandry .....…….....

No. of families in animal husbandry alone .....…….....

In our country farmers believe that animal husbandry is part and parcel of agriculture.

Let us do:

Form a group with four or five students in your class. Discuss the reasons. Why does a farmer rear cattle?

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People living in rural areas used to domesticate animals like cows, buffaloes, bullocks, goats, sheeps, pigs, hens, etc. Supplying of nutritious food, accommodating clear and hygienic shelters for animals are very important issue in animal husbandry. Generally villagers send their cattle to rear at the places where grass is easily available.

Fig. 2 Cattle rearing

- Where do people rear their cattle in your village?

Are there cattle rearers in your village. Have a talk with them and collect information about cattle rearing. For this you need a questionnaire. Following questions are helpful to you. You can add some more questions as you wish.

- What are the cattle here?
- At which places fodder is available?
- What are the places where water is available?
- Are there any differences between rearing of cows, buffaloes, goats and sheep?
- What are the major problems that cattle rearers generally face?

Generally one person is appointed for rearing of cattle. He is paid by the villagers. Recently this type of practice gradually disappeared in our villages. Some of the farmers keep their cattle in the sheds. They do not take their cattle to the fields. They supply fodder in those sheds. Rearing cattle like bulls, cows and buffaloes in large scale is also the same in sheds. Bulls are mainly reared for use in agricultural practices like ploughing. Most of the farmers in our country are cultivating the land area of less than one hectare. Even though mechanization is increasing in agriculture, farmers use bullocks in ploughing and other agricultural practices.

- Make a list of agricultural practices by using bullocks and he buffaloes.

Rearing of goats and sheep is also related to agriculture. Besides agriculture, cattle rearing and sheep rearing is beneficial to farmers. Cattle rearers make fences in the fields at off crop seasons. They keep their sheeps and goats

in the fenced enclosures.

- Think in which way this practice is helpful to the farmer as well as field crops.

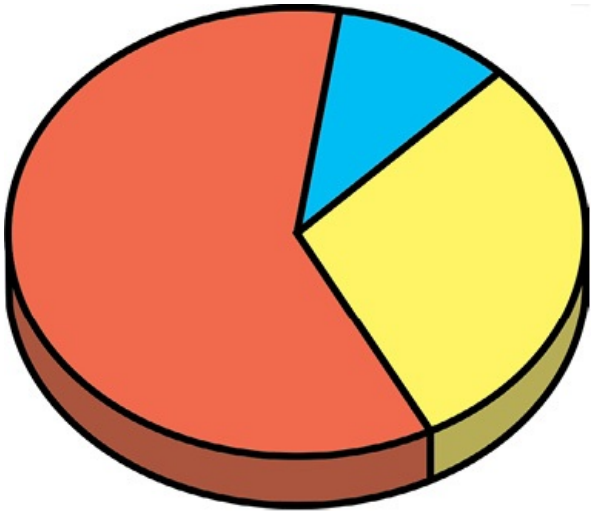
Taking care of animal health is also an equally important task in animal husbandry. Most of the times cattle sheds become unclean because of the remains of fodder, dung and urine. Dump these wastes away from the shed. Care should be taken to prevent the growth of lice and mytes on cattle's body. Galikuntu is a common and dangerous disease partially in cows and buffaloes. Sheep and goats suffer from worm infections (Nattala Vyadhi).

Some parasitic diseases cause damage to liver and intestine. Viral and bacterial diseases also affect milk production. Particularly in rainy season, cattle are disturbed by mosquito bite. Cattle can be protected by covering mosquito nets. Veterinary doctors provide treatment and health care for these cattle.

- Where is veterinary hospital located in your area?
- Which employees are working there and what do they do?
- Meet a nearby veterinary doctor or animal husbandry assistant, collect information about common diseases in cattle and prepare a note on them.

Milk Production:

Our government treats producing milk as an industry. We get milk from cattle. Let us observe the following pie diagram.



Cows

Buffalos

Goat, Donkey, Camel

- From which animals we get maximum milk production?
- In which areas people use camel milk?
- Did you ever see people taking donkeys milk? Why was it preffered?

Generally farmers rear 1 to 5 cattle in small scale at their homes to produce milk. They supply fodder from their agricultural fields only.

- What types of fodder farmers generally feed the cattle ?
- How farmers preserve fodder for cattle after harvesting?

Let us observe the following graph. It Shows the rate of milk production in various countries. Observe the position of our country. Discuss in your class, why we are lagging behind in comparison to other countries.

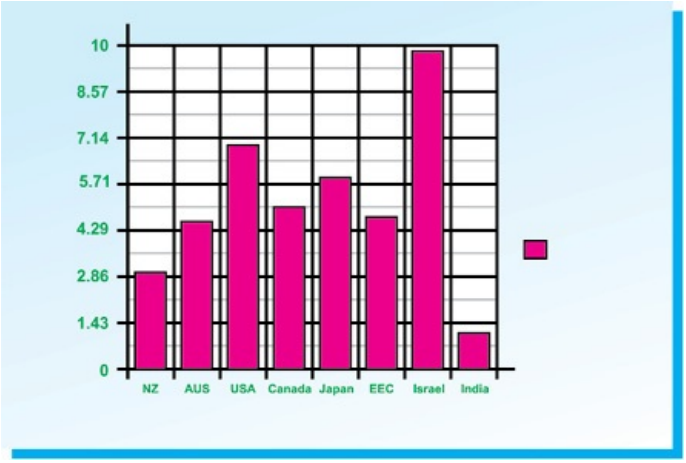


Fig. 3 Milk Production

Among cows, traditional species give 2 – 5 liters of milk per day. Murra, species are reared in most of the districts in our state. They give up to 8 liters of milk per day. Haryana, Jaferabad, Nagapuri are the traditional varieties of cows which give good quantity of milk. Jersy (England) and Holstein (Denmark) are the Foreign varieties. They give 25 liters of milk per day. These foreign varieties are cross bred with our native or local varieties. They give 8 to 20 liters milk per day. Cows play vital role in total milk production of our country.

Fig. 4 Jersy

Fig. 5 Holstein

Out of milk produced in our country 60% is used to prepare cheese, cova, ghee, curd, milk powder and other milk products. There are number of dairy farms in our state. The milk in dairy form is collected from households and pasteurized.

Pasteurization : Pasteurization of milk ensures the destruction of disease producing organisms present in milk. In this process milk is heated at a particular temperature (72^0C) for a definite period of time (30 minutes). Prior to this, the milk was being cooled to below 10^0C.

Fig. 6 Milk Collection

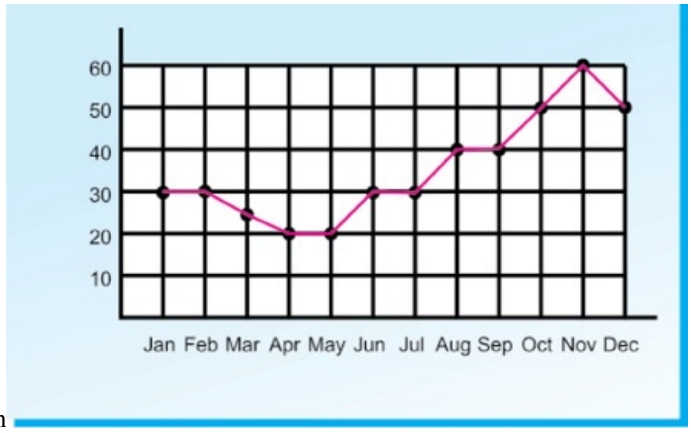
- Is there a milk collecting centre in your village?
- How do they collect milk and export?
- Do you know how they decide cost of milk?
- Where is milk chilling center located in your area? (For this you need to observe milk packets which are available in the market)

There are private and government milk collecting and chilling centers in our state. According to economical and statistical survey of India-2011, about 40 to 60 lakh liters of milk is produced every day in our state.

Fig. 7 Chilling Center

- Do you know in which month the rate of milk production is high? Why?

Milk production is higher particularly in some months compared with remaining months. Let us observe the graph showing milk production in our state.



Milk production

Months

Fig. 8 Monthwise milk production

- Why the milk production is higher during those months than remaining months? Discuss in your class and find out the reasons.

Prof. J.K. Kurian, father of white revolution in India, worked a lot in increasing milk production through co operative societies to fulfil the needs of our country. He proposed innovative activities in producing hybrid varieties of cows and buffaloes, animal health, milk collection and preservation. There is a great improvement in production of milk under the scheme – Operation flood.

60 to 70% of expenses in maintaining animals is for feeding them. Animals need food for two purposes. One is to maintain themselves healthy and other is for reproduction. We provide hay, green and dry grass, oil seed cakes of groundnut etc. used as fodder for cows and buffaloes. These nutritious food helps to give good quality of milk.

Do you know?

Milk is the secretion of the mammary glands in animals. During the period following at least 72 hours after calving or until the milk is colostrum free, milk appears as white opaque fluid, in which fat is present as emulsion, protein and some other minerals, vitamin A, D and E and 80 to 90% of water. Nowadays cattle rearers and dairy farmers use hormone injections to get high quantity of milk. These hormones settle down in our body to cause various diseases like early reaching of puberty. Chemicals used in chilling centers to preserve milk also cause damage to our health.

Selection procedure:

Care should be taken while buying cattle for milk production. The following points should be kept in mind.

1. Select high milk producing varieties, either traditional or hybrid.
2. Observe 2 to 3 days for average milk production.
3. Number of yields (younger ones)
4. Body size, capacity of eating fodder and health.
5. Consult a veterinary doctor, an official of Director of animal husbandry.

- Some of our rural people are experts in identifying high producing varieties. Ask those people how they identify and write a report on their experiences.

Practices in livestock keeping:

Being high milk yielding varieties, livestock (The animals that are used for milk and agriculture are called livestock) rearing is very important. Traditional livestock are depleted because of hybrid varieties. Let us read the following case study to know how local breeders conserve their livestock.

I am Ramanayya. My family have been maintaining local breed of bullock called 'Kangayam'. It is suitable for drought areas. There are no other good bulls in our area. Kangayam is a strong and healthy local variety. These bulls have small or short horn, thin tail, short face, prominent eyes, large hooves, wider shoulder bone and larger hump. We select these calves and feed them to become bulls. One bull is able to serve 20 to 30 cows reproduction in a month. The conceiving rate is more than 80%. Very few cows are brought for second time for servicing. We

charge Rs.300 for servicing. We have three buffalows too. Now a days most of the villagers are crossing their cows and buffalows by using injections at veterinary hospitals. Our income has been reduced. But people rearing with one or two cows took services from me.

Do you know?

In Odisa traditional livestock – Chilka buffalows are reared. They take care to avoid cross breeding with Murra. They graze during night times in brackish water of Chilka lake. They return home in the morning give milk without any extra feed. This milk tastes a bit salty and kept up to 7 days without refrigeration.

In our country people believe that the cattle rearing is not the only economic source. Cattle are part and parcel of our culture. They treat them as their family members. During some festivals they decorate their cattle. On what occasions they decorate the cattle in your village? Some people call them by names also. Do they respond when called by names? Do you have any such experience with your pets?

Did you ever see some persons collecting bones of dead animals? What do they do with these bones? Another side of cattle rearing is, getting leather which is used in the leather industry. Bones are used in fertilizer industries.

Fig. 9 Bio gas

Biogas production is also a useful project in animal husbandry. Do you know, what is Biogas? Is there any biogas center in your village? Collect information about biogas production from your school library or internet and write a note on it. Then display it on wall magazine.

Meat processing from animals is another side of animal wealth. Production of meat in large scale takes place in slaughter houses (Kabela). We get beef from bulls and buffaloes, pork from pigs, mutton from sheep and goats.

These are the prominent meat varieties.

Poultry :

Production and rearing of hens on a large scale is generally called poultry. 50 billion hens are reared worldwide for eggs and chicken. We know that farmers rear cocks and hens in villages. Most of these are local varieties (Natukollu). We get 74% chicken and 64% of eggs only from poultry farms. Poultry has emerged as one of the major industries in last two decades. India achieved 4th position in the world by producing 41.06 million eggs per annum. And also placed in 5th position for production of meat about 1000 million kgs per annum.

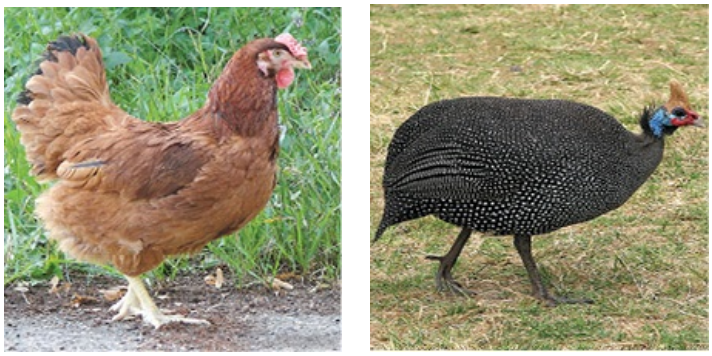


Fig. 10 Local Varieties

- Are the hens reared in the poultry is same as our traditional varieties reared by farmers in the villages?

Generally poultry farms are of two types. One is for production of eggs and other for meat. Broilers are commonly used variety in poultry. They are reared for meat.

Natural, wild varieties grow completely in 5 to 6 years. But broilers grow completely in just 6 to 8 weeks. This happens due to genetic modification in the hens.

- Think and discuss – Is genetically modified food useful or not?

New Hampshire, white Plymouth, Rhode island red, white leg horn, Anoka are the foreign varieties of meat giving species.

Fig. 11 Broiler, Layer

- Do you know chicken-65. Why is this called so?

Layers are reared for production of eggs. Some hens are able to lay 300 to 350 eggs in their life span. But, one has to follow proper management techniques up to 21 to 72 weeks for getting eggs.

After a period, the capacity of laying eggs decreases. This is one of the reasons why people are more interested in rearing broilers.

Natural, country varieties are good for hatching purpose. Aseel, Kadaknath, Chittagang, Longshan, Bursa are the pure local varieties. But the rate of production of eggs is lower than hybrid varieties.

Aseel (Berisa kodi) the Indian traditional variety is meant for fighting because of its pugnacity, high stamina and majestic gait.

Fig. 12 Aseel

- Have you heard about cock fight during some festival seasons? Think and discuss in your class about this type of practices which show human cruelty towards animals.

We are rearing hens for eggs and meat. Local chicken breeders rear both varieties of hen. By using incubaters chicken breeders produce chicken in large scale. Hatching of eggs is interesting job. Our rural practioners hatch eggs by placing them under broody hen.

Fig. 13 Hatching

- Do you know how many days a hen spends to hatch its eggs?
- Prepare a detailed note on hatching eggs by observing at your village. If you need, please draw pictures also.

Fig. 14 Poultry fom

During January to April, egg prices are high. Do you know what is the reason? This is because of most of the eggs are used for hatching. In this period, rate of hatching is more. Hatchability of eggs is generally influenced by 37 to 38°C temperature. In poultry industry hen wastes (litter) is used as nutritional manure in agriculture.

Egg is a nutritious food. Collect information about various nutrients in egg and write a note on them in your note book.

Activity-1

Form a group of 5 or 6 students. Collect different types of hens and find their characters. If you want to know more details, you need to ask hen rearers or poultry farmers in your village. Do not forget to collect information about the feed and diseases, treatment by using local technology.

NECC

If you want to be a healthy person eat egg every day. This is the slogan of National Egg Co-ordination Committee. Egg is a good nutritious food which is easily available for all.

NECC

NATIONAL
EGG CO-ORDINATION
COMMITTEE

Do you know?

Emu culture

Emu is the flight less bird from Australia. It is the second largest bird in the world after Ostrich. This amazing bird weights nearly 50 kg. and run at 40 miles per hour. Emu farming is also a commercial practice like hen. Recently farmers of Adilabad, Medak, Nalgonda and some other districts of Andhra Pradesh, started the Emu farming. Meat, chicks, skin, leather, oil, feathers eggs are the main products in the Emu culture. Its meat and eggs are costly. The Emu market is not so good at present in our our state.

Emu egg

APICULTURE

Culture of Honey bees (Apis) is called Apiculture. It is the most beneficial and eco friendly activity. Development of apiculture is not only for honey production but also very much useful for crop pollination. Honey bees are best pollinators of many agricultural crops.

Queen Worker Drone

Fig. 15

- In what way honey bees are helpful in pollination?

Presently there are five well known species of honey bee in India. Apis dorsata, Apis indica, Apis floera, Apis melipona, Apis prigona and Apis cerena. Apis cerena, an Indian honey bee, produces 3-10 kgs of honey from a colony per annum. Apis mellifera, an European honey bee produces 25-30 kgs of honey per annum.

Do you know?

Honey has probably been associated with man since very early days. The first proof of this association is evident from the rock paintings made by the primitive man thousands of years ago. Man knows about the art of bee keeping in the regions of early civilization. The Egyptians were well acquainted with bee husbandry 4000 years ago as they practised migratory beekeeping. The *Rigveda*, probably written between 3000 B.C. and 2000 B.C, contains many references to bees and honey. They named honey as a divine food.

It was during the Nineteenth century, the bee keeping, as a result of scientific research, became a commercial activity.

Honey bee species are social insects like ants which lives in colonies. A honey bee colony consists of three types of bees. One queen, several thousands of workers and few hundreds of drones.

There is only one queen bee in a colony. The primary function of a queen is to lay eggs (800-1200 eggs per day). The life span of queen is two to three years, a worker has 5-6 weeks and the drone has 57 days. There are sterile females which are called Workers in the hive. These bees attend to indoor duties during first three weeks of their lives such as secretion of royal jelly, feeding of the brood. After three weeks they attend outdoor duties like collecting nectar, pollen and water. Drones are the male members of the colony. They are very lazy and unable to gather food. Their main duty is participating in mating. Mating takes place in the open when the queen is in flight. The Drone dies during the act or immediately. After wards its abdomen bursts to open allowing the genital organs function.

Sources of nectar

Plants which contain nectar and pollen liked by bees are called bee flora.

The following are some of the more important plants either wild or cultivated. Fruit trees like citrus, apple, guava, tamarind; Cultivated field crops like mustard, gingelly, wheat, cotton, sunflower; Vegetable plants like beans, lady's finger, brinjal; Timber yielding trees like acacia, neem, sal and bushes, shrubs and natural and ornamental flower plants are all the sources of nectar. The bees of a colony sometimes rob another colony especially during drought period.

Fig. 16 Bee hive

- Generally where do you find honey Bee hives in your surroundings?
- In which seasons we find honey Bee hives?
- Collection of honey from hive is a careful activity. Write a note on how people collect honey from hives. What did they do for this?

The bee wax and bee venom are other products in Apiculture. Bee venom is used for the preparation of 'Apis tincture'. It is used in Homeopathic treatment. The major uses of bee wax are production of polish cream, nail polish, etc,.

Production of honey in large scale is by providing artificial bee hives. The hive consists of floor board, brood chamber, super chamber, top cover, inner cover, frames and entrance rod. These parts can easily be separated.

Fig.17 Artificial bee hive

The hive may be double walled or single walled. These artificial hives are not similar to natural hives. Try to find out the differences between these two hives. To get more yielding of honey from the colonies, a bee keeper has to follow some management techniques. Various pests and predators attack the honey bee colonies. Wax moths, wasps, robber flies, dragon flies attack honey bee colonies. King crow, Bee eater are more harmful during swamp period. Bee keepers should protect bee hives from the pests and predators.

- Ask your parents / teacher how a bear hunts bee hives for honey.

Fisheries:

Fish constitute an important and rich sources of high quality animal protein. India has a coast line of about 7500km and the total available area for fishing both inshore and offshore is nearly 0.48 million square meter. In addition there are extensive inland water areas comprising of numerous rivers, fresh water and brackish water lakes, reservoirs, tanks, ponds, swamps, etc.

Nowadays fish and prawn culture is a large scale industry in the coastal districts of our State. Most of the farmers convert their agricultural fields into prawn culture ponds. The marine water is the big source of fish. It is constituted by several groups of varying magnitude and importance. The sardines, mackerel, crustaceans, tunas, molluscs, catfish, ribbon fishes are some of the marine varieties. Besides these, the sea weeds may be included which form an important living source from the sea. Prawns, lobsters, and crabs together constitute the crustacean fishery. Murrel(korramenu), katla(jalla), katrana(bochalu), rohu(mosu), seer (Vanjiram) are the local varieties.

Fish Prawn

Crab

Fig. 18

Cultivating fish and prawn is a large scale industry in our state. Most of the coastal districts of our state are now cultivating fish and prawn by using sea water as well as pure water. They collect breed of fish suitable to water. Breeding and catching fish are important activities in fish culture.

- Write a list of fishes that are available in your surroundings. Just write local names only.
- Do you know how to catch fish in a pond?
- How to catch fish in a large scale?

Marine Fisheries:

India's marine fisheries sources include 7500km of coastal line and deep seas beyond it. Popular marine fish varieties include Macerel, Tuna, Saradines, and Mombay duck. Marine fish are caught using many kinds of fishing nets through fishing boats. With the introduction of synthetic fiber nets, there has been revolution in fishing gear material. Fishermen catch fish by using machines is called mechanized fishing. They catch tons of fish everyday.

Fig. 19 Mechanical fishing

- Think what will happen if mechanized fishing continue for a long run.

Some marine fishes of high economical value are also found in sea water. This include finned fish like Mullets, Bhetki and Peral spots, Sea fishes such as prawns, Mussels and Oysters as well as sea weed.

- Ask your teacher what are the uses of Oysters?
- Tuna is an important fish which is available in our marine area. Collect information about Tuna and in what way it is important?

Inland fisheries:

Fresh water resources include canals, ponds, reservoirs and rivers. Brackish water resources, where seawater and fresh water mix together, such as estuaries and lagoons are also important fish reservoirs. Fishing is also done in such inland water bodies, but the yield is not high.

Fig. 20 Fish pond

More intensive fish farming can be done in composite fish culture systems. Both local and imported fish species are used in such systems.

In such a system, a combination of five or six fish species are used in a single fishpond. These species are selected so that they do not compete for food among them and have different types of food habits. As a result, the

food available in all the parts of the pond is used. As Catlas are surface feeders. Rohus feed in the middle zone of the pond, Mrigals and common carps are bottom feeders, and Grass Carps feed on the weeds. This species (Fig. 15.6) can use all the food in the pond without competing with each other. This increases the fish yield from the pond.

- What is blue revolution? What are its effects? Discuss in your class room.

Do you know?

Sea weeds constitute an important marine resource and are found along the Rocky intertidal and sub tidal regions of the coasts of India. The Sunderbans, the Chilka lake, the deltas of Godavari and Krishna, Gulf of Mannar, Plakbay, Gujarat coast and around Lakshadweep, Andamon and Nikobar Island are the areas rich in sea weeds. They are used for human consumption, as cattle and poultry feed, as manure and for industrial purposes as the sources of Phyco colloids like Agar-agar.

One problem with such composite fish culture is that many of these fishes breed only during monsoon. Even if fish seed is collected from the wild, it can be mixed with that of other species as well. So, a major problem in fish farming is the lack of availability of good quality seed. To overcome this problem, we have now been worked out to breed these fish in ponds using hormonal stimulation. This has ensured the supply of pure fish seed in desired quantities.

Do you know? Estuaries are a part of the river systems. These are extremely interesting areas. The environmental conditions are in state of flux and the Fauna also is a combination of fresh and salt water species which can tolerate considerable variations in salinity.

Fish culture is sometimes practised in combination with a rice crop, so that fish are grown in the water in the paddy field. Growing fish in paddy field is also multi utilitarian practice. The reason for this is increasing use of inorganic fertilizers and insecticides in paddy fields which cause deleterious effects on fish and predation for birds, snakes etc. Cultivating fish in paddy fields lower pests like stem borers on paddy.

Fish is highly perishable. The processing of fish is very important in fish culture. There are several traditional methods of curing fish depending upon the local demands and export. Sun drying, semi drying, salting and drying, pickling and pit curing are some of the common methods employed in our State.

- Make list of food preservation practices in your area.

Animal husbandry, poultry, fish culture, bee culture etc. are the major practices in food production. Our government provides opportunities to improve animal food production to fulfill the food requirement of growing population.

Key words

Animal husbandry, livestock, jersy, Holstein, pasteurization, biogas, poultry, hatching, incubator, apiculture, honey bee hive, honey wax, queen bee, drone, aqua culture, marine fisheries, inland fisheries, breeding, food processing.

What we have learnt

- Providing food, shelter and protection to cattle to get milk, meat and other purposes collectively called animal husbandry.
- Rearing cattle in rural areas is a traditional practice.
- During the month of October and November milk production is higher than remaining year.
- Veterinary doctors helps the cattle rearers for artificial insemination.
- Broilers are meat yielding varieties whereas Layers are egg yielding varieties.
- Incubators are useful for hatching eggs artificially.
- Production of honey is otherwise called apiculture.
- Bee venom is used for preparation of apis tincture which is used in Homeopathic medicine.
- Cultivating fish in fresh and salt water is called aqua culture.
- Because of aqua culture many agricultural lands converted into fish ponds in the coastal districts of Andhra Pradesh.
- Marine and inland fisheries meet the global food needs.

Improve your learning.

1. One honey bee hive consists of different types of bees. What are they? How they differ from each other? (AS 1)
2. Make a list of characters of local variety of buffaloes which give good quantity of milk in your village? (AS 1)
3. Explain the process of hatching eggs under broody hen in rural areas? (AS 1)
4. Write about the accessory products produced in animal husbandry. (AS 1)
5. What is estuaries, how they are suitable for both marine and river fish to live. (AS 1)
6. If you have a chance to visit milk chilling center, what doubts would you like to clarify? Please list out them. (AS 2)
7. Collect news from news papers about milk production and impurities in milk. Prepare a note and display it on wall magazine. (AS 4)
8. Collect information about sea weeds, sea kelp from your school library and write a note with examples. (AS 4)
9. Observe nearby poultryfarm and find out how do they export eggs to market? What material is used for transportation? (AS 4)
10. Observe a dry honey bee hive and how the bees built it. Draw a picture. How does it look like? (AS 5)
11. Agriculture and animal husbandry are both sides of the same coin. How can you justify this? (AS 6)
12. How do you appreciate the uses of cattle? (AS 6)
13. What makes you amazing in division of work in Honey bee colony. Support your answer. (AS 6)
14. Conversion of agricultural lands into fish ponds leads to food crisis and environ mental pollution. Write your opinion to conduct a debate on this issue. (AS 7)