Revision Notes on Strategies for Enhancement in Food Production

Poultry

Poultry includes the birds like chicken (hen), ducks, geese and turkey. Poultry farming deals with the rearing of them for their eggs and meat. Fowls are widely distributed as domesticated animal since time immemorial, but in the present century, it has become an important small scale industry due to modern need for palatable and nutritive food which it provides in the form of eggs as well as adult animal. An egg laying poultry bird is called hen and the poultry birds groomed for obtaining meat are called chicken or broilers.

Livestock

(i) **Meaning of livestock:** The word livestock refers to the domestic animals kept or dealt in for use or profit. It includes cattle, buffaloes, sheep, goats, pigs, horses, mules, donkeys and camels. The most important of these are cattle and buffaloes.

(ii) **Cattle (*Bos indicus*) Buffaloes (*Bos bubalus*):** The word cattle includes cow (adult female), bull (uncastrated adult male), bullock or OX (castrated adult male) and steer (young castrated male).

(iii) **Importance of cattle and Buffaloes:** Cattle and buffalo are most important forms of domesticated animals. They are next to land in use for farmers. They are widely used for:

(a) **Agricultural Operations:** Cattle are used in agricultural operations such as ploughing, harrowing and levelling land; in harvesting and thrashing ripe crops; and in working wells, etc.

(b) **Milk:** Cows and buffaloes provide milk, an important human food with all the essential materials.

(c) **Transport:** Cattle are employed in cart driving to transport men and materials. However, they are being fast replaced by machines.

(d) Manure and fuel: The dung provided by them acts as valuable manure for maintaining the fertility of the soil. It is also used for preparation of biogas or gobar gas. Dung cakes provide cheap fuel to the poor, but the fields get deprived of important manure.

(e) **Leather:** Hides obtained from these animals are used for the preparation of leather goods.

(f) **Glue and gelatin:** Their bones, horns and hoofs yield glue and gelatin.

(g) **Meat:** Beef and buffalo meat are eaten by certain people

(h) **Hair:** Hair is used for making brushes.

(i) **Hybridisation:** Indian bulls are used for

(iv) **Breeds of cattle:** There are 26 breeds of cattle and 7 breeds of buffaloes in India. They differ in colour, general body build, form of horns, forehead and geographical distribution. The best cattle breeds occur in the drier regions of the country. The most important breeds of milk cows in the United States of America are Holstein-Friesian, Jersey, Quernsey, Ayrshire and Brown Swiss. Depending upon the utility, the cattle are classified into the following groups;

(a) Milch breeds that give good milk-producing cows,

(b) Draught breeds which give good working bullocks,

(c) General utility (dual-purpose) breeds the females of these breeds are good milk-producers and the bullocks are good draught animals.

Some Breeds of Indian Cattle

Milch Breeds	**Distribution**
1. Gir	Gujrat, Rajasthan
2. Sahiwal	Punjab, Haryana, Uttar Pradesh
3. Red Sindhi	Andhra Pradesh
4. Deoni	Andhra Pradesh
Drought Breeds	**Distribution**
1. Malvi	Rajasthan, Madhya Pradesh
2. Nageri	Delhi, Haryana, Uttar Pradesh
3. Hallikar	Karnataka
4. Kangayam	Tamil Nadu and other parts of South India
General Utility Breeds	**Distribution**
1. Haryana	Haryana, Punjab, Bihar, Madhya Pradesh, Gujrat
2. Ongole	Andhra Pradesh
3. Kankrej	Gujrat
4. Tharparkar	Andhra Pradesh, Gujrat

Some Breeds of Indians Buffaloes

Breed	**Distribution**
Murrah	Punjab, Haryana, Uttar Pradesh
Bhadawari	Uttar Pradesh, Madhya Pradesh
Jaffrabadi	Gujrat
Surti	Rajasthan, Gujrat
Mehsana	Gujrat
Nagpuri or Ellichpuri	Central and South India
Nili Ravi	Punjab, Haryana

Apiculture

(1) Apiculture is the science of rearing honeybees for obtaining honey, wax and venom. It is a profitable money-making hobby. It forms a cottage industry, when carried out on a large scale.

(2) Three species of honey bees are commonly found in india vig. *Apis indica* (The small indian bee). *Apis florea* (The little indian bee) and. *Apis dorsata* (the giant bee) other important species include *Apis milifera* (the common European bee.

(i) **Honeybee-*Apis*:** Like termites, honeybees are social insects known for producing honey and beeswax, and for living in very highly organized colonies. These feed upon nectar and pollen of flowers, possess "sucking and chewing" mouth parts, and undergo complete metamorphosis. Each colony has its own nest called honeycomb or beehive.

(ii) **Division of labour and polymorphism:** Each beehive harbours a colony of thousands of polymorphic bees belonging to a single family. The polymorphic individuals are of three main types (i) a single queen (fertile female)(ii) one to a few hundred drones (fertile males) and (iii) thousands (upto 60,000) of worker bees (sterile females).

(iii) **Life History:** Queen lays about 2,000 eggs a day. The eggs are laid in the comb, one in each cell. They hatch out into larvae in three days. They are fed on royal jelly for a few days. But the larva which develops into the queen will be fed on royal jelly continuously.

During breeding, the queen bee flies in the air along with the males. This phenomenon is called nuptial flight. During nuptial flight the queen copulates with a male Copulation occurs in the air. Then the bees return to the comb and the queen starts laying eggs.

(iv) **Bee-Hive**: Honey bee is one of the few domesticated insects. In modern days bee colonies are reared in artificial wooden boxes for maximum production of honey and wax. The artificial box where the bee colony is maintained and managed is called hive. The place where hives are kept and managed is called apiary.

(v) **Honey extraction:** Honey is stored in combs of super frames. It is extracted from the comb by a simple machine called honey extractor. It has a drum containing a rack inside to hold the super frames. It is made to rotate by a set of two-gear wheels, operated by a handle.

The super frames are removed from the hive. The caps of the comb cells are cut off by a double edged knife. Then the frames are fixed in the rack and the rack is made to rotate by operating the handle. The honey is forced out into the drum from the comb cells. From the drum the honey is collected in vessels through an exit present in the drum.

(vi) **Location of Apiary**

(a) The hives should be set, in places where there are plenty of flowering plants.

(b) They should be placed in shady places.

(c) The place should be neat and clean and free from any obnoxious smell.

(d) There should be clean drinking water nearby because each bee colony requires two glasses of water per day for their survival

(vii) **Protection**

(a) Honey bees should be protected from garden lizard and snakes.

(b) Black ants steal honey. So water should be placed at the base of the stand.

(c) Wasps kill honey bees. So protection should be provided against wasps.

(d) Wax-moth damages the combs. So the combs must be " protected from wax-moths.

(viii) **Chemical composition:** Honey contains nearly 80 different substances of importance to human beings. The important chemicals are as follows:

(a) It contains a large amount of glucose or fructose.

(b) It contains proteins as well as fats.

(c) The vitamins present in honey are A, B_1, B_2, B_3 , B_6, *C, E* and *K*.

(d) A variety of enzymes are present in honey. They include diastase, invertase, saccharase, catalase peroxidases and lipases.

(e) It contains many organic acids. The most important organic acid is formic acid; other organic acids are malic acid, citric acid, tartaric acid and oxalic acid.

(f) It contains a variety of minerals like Ca, Na, K, Mg, Fe,Cl,P,S etc.

Fisheries

(i) Fishes are a valuable and easily accessible source of food, rich in protein, highly nutritious and easily digestible. By the aquatic animals, they are abundantly available from sea, rivers, lakes, ponds and marshes.

(ii) Aquaculture is the production of useful aquatic plants and animals such as fishes, prawns, shrimps, lobsters, crabs, molluscs by the proper utilization of small and large bodies of water. Pisciculture is the production and breeding of fishes by man in ponds.

Classification of cultivable fish species

Zoological name	Common Name	Areas of availability
(a) Fresh water fishes		
1. *Catla catla*	Catla	All over India common in Krishna and Godavari rivers
2. *Labeo rohita*	Rohu	North, East and South India
3. *Labeo calbasu*	Calbasu	North and South India
4. *Cirhinus mrigala*	Mrigal	North and South India
5. *Mystus singhala*	Singhala	All over India
6. *Heteropneustes fossilaris*	Singhi	All over India
7. *Wallago attu*	Malli	North, east and South India
8. *Clarius batrachus*	Fresh water shark magur	All over India
(b) Brackish water fishes		
9. *Chanos chanos*	Milk fish	A.P.coast
10. *Mugil cephalus*	Grey mullet	East coast
11. *Laters calcorifer*	Perch	East coast
(c) Marine fishes		
12. *Sardinella longiceps*	Oil sardine	West and south coasts
13. *Harpodon heherius*	Bombay duck	Maharastra coast
14. *Hilsa ilisha*	Hilsa/ Indian shed	Coastal India
15. *Stromateus sinensis*	Pomfret	Indo pacific coast
16. *Anguilla anguilla*	Eel	Coastal India
17. *Aluitheronema*	Salmon	East and west coast
18. *Cyano-glossus semifas-ciatus*	Flat fish	East coast of India

(iii) **Culture method:** The success in fish culture and the high production of table - size fish through carp culture depends largely on the designing and construction of ponds. The basic principles involved in designing and construction of carp culture ponds are of very specialized nature and vary from region to region depending upon several factors like topography, soil types, water supply etc. The requirements with regard to the designing and construction of fish farm are entirely different from those attributed to agriculture and animal husbandry farms.