STRATEGIES FOR ENHANCEMENT IN FOOD PRODUCTION (ANIMAL HUSBANDRY)

INTRODUCTION

Animal husbandry is the practice of taking care and breeding of domestic animals by applying scientific principles. It is estimated that more then 70 per cent of the world livestock population is in India and China. However, it is surprising to note that the contribution to the world farm produce is only 25 per cent, i.e., the productivity per unit is very low. Hence, in addition to conventional practices of animal breeding and care, newer technologies also have to be applied to achieve improvement in quality and productivity. These practices includes:

1.1 Management of farm and farm animals

1.2 Animal breeding

Management of Farm and Farm Animals

Dairy farm Managment

- Dairying is management of animals for milk and its products for human consumption.
- Cattle (Bos indicus) and Buffaloes (Bubalus)

Uses :

(i) **Agricultural operation :** Ploughing, Harrowing, Levelling

(ii) **Milk :** Important food having all essential nutrient

(iii) **Transport :** Pulling cart & Wagon.

(iv) Manure & Fuel : Dung : (1) Maintain fertilits of soil
(2) Production of biogas & Cheap fuel

(v) Leather, Glue and Gelatin

(vi) Meat.

Breeds → 3 Breed

Milch → De Re Gi Sahi
↓ ↓ ↓ ↓ ↓
Milk producing Deoni Red Sindhi Gir Sahiwal

Draught → Ma Na Ka Ha
↓ ↓ ↓ ↓ ↓
Working Malvi Nageri Kangayam Hallikar

General Utility → Ongole, Kankrej, Tharparkar
↓
Used for both

* **Foreign dairy breeds (Exotic breeds):** Jersey (England), Holstein-Freisian (Holland), Brown Swiss (Swit zerland), Ayrshrie (Scotland) have been imported to give better results.

* **Some improved hybrids:** Karan swiss, Karan Fries. Sunandini etc.

- **GOAT (*Capra capra*)**
  - It is also called **poor man's cow** because it yields a small quantity of milk and feeds on a variety of wild plants even prickly ones.

Poultry Farm Management

- Poultry is the class of domesticated fowl (birds) used for food or for their eggs. They typically include **chicken** and **ducks**, and sometimes **turkey** and **geese**. The word poultry is often used to refer to the meat of only these birds, but in a more general sense it may refer to the meat of other birds too.

- **HEN**

(i) **Indigenous (Desi) or Indian breeds -**
  - Aseel is best game bird, it is used in cock fighting.
  - Poultry birds exclusively grown for meat is called **broilers** (plymoth rocks).

(2) **Exotic Breeds** - White leghorn

Animal Breeding

- Breeding of animals is an important aspect of animal husbandry. Animal breeding aims at increasing the yield of animals and improving the desirable qualities of the produce.
- **Breed :** A group of animals related by descent and similar in most characters like general appearance, features, size, configuration, etc., are said to belong to a breed.
- **Types of Breeding :**
  (i) **Inbreeding** : Inbreeding refers to the mating of more closely related individuals within the same breed for 4-6 generations. The breeding strategy is as follows – superior males and superior females of the same breed are identified and mated in pairs. The progeny obtained from such matings are evaluated and superior males and females among them are identified for further mating. A superior female, in the case of cattle, is the cow or buffalo that produces more milk per lactation. On the other hand, a superior male is the bull, which gives rise to superior progeny as compared to those of other males. Inbreeding increases **homozygosity**. Thus inbreeding is necessary if we want to evolve a pureline in any animal. Inbreeding also exposes harmful recessive genes that are eliminated by selection. It also helps in accumulation of superior genes and elimination of less desirable genes. Therefore, this approach, where there is selection at each step, increases the productivity of inbreed population. However, continued inbreeding, especially close inbreeding, usually **reduces fertility** and even **productivity.** This is called **inbreeding depression**. Whenever this becomes a problem, selected animals of the breeding population should be mated with unrelated superior animals of the same breed. This usually helps restore fertility and yield.
  (ii) **Out-breeding :** Out-breeding is the breeding of the unrelated animals, which may be between individuals of the same breed (but having no common ancestors), or between different breeds (cross-breeding) or different species (inter-specific hybridisation).

Apiculture

- Maintenance of hives of honeybees for the production of honey.
- Each colony has more than 40,000 to 50,000 individual cnsisting of 3 casts.

SOCIAL ORGANISATION :

(1) Queen : Develops from unfertilized egg feeds on royal jelly
– Function Reproduction
– Legs and wings short but crop is long

(2) Drone : 100 in one hive
– Salivary & wax secreting glands absent
– Develops from unfertilized egg
– Helps in fertilization

(3) Worker : Maximum in hive & smallest
– Wing and mouth parts are very strong
– Mouth parts & legs modified for collection of nectar.

- **Important species of Honey-bees :**
  (i) ***Apis dorsata* (Rock bee)- I**t is also named as saarang bee. It is of largest size and produces highest yield of honey. However, it is of highly aggressive nature and migratory species, which is not suitable for rearing by man.
  (ii) ***Apis indica* (Indian Mona-bee)-** It lives across the whole country of India and is smaller in size than saarang-bee, It is mild in nature, so that it is easily manageable during rearing. Mona-bee yields about 3-4 kg. of honey per hive.
  (iii) ***Apis florea* (Bhringa-bee)-** This bee is smallest in size and of timid nature.
  (iv) ***Apis mellifera* (European bee)-** This bee is of mild nature. It yields more honey than mona-bee. It is the most useful bee for commercial purpose. The Italian variety of this species is by far the most important variety.
- **Communication by dance**

Those bees which go out for search of food have highly developed visual & taste sense for correct recognition of route. **Bees recognised their route with the help of position of sun & smell of flowers.**

Bees communicate with each other so that all other members also find the food source.

Karl Von Frish in 1969 explained the "Dance of honeybee" and he got noble prize for that.

– The following type of dances can be seen in honey bees.

1. **Round Dance :** This dance indicates that the food source is about less than 75m from a hive.
2. **Tail wagging Dance :** With the help of this dance bees give the information of that food source at a very far distance. In it direction & distance of food source are indicated according to the position of sun.

- **Honey** - It is an aromatic viscid, sweet material consists of 17% water, sugar protein, minerals vitamins etc.

i. Water ii. **Fructose** iii. Glucose
iv. Sucrose v. Enzymes & pigments vi. Ash vii. Vitamins - B_1, B_6, C & D

- **Bee wax**
  - It is very useful by product of bee keeping industry
  - It is obtained from bee hives
  - This is a secretion of worker bees abdominal glands

LAC CULTURE

– Lac is resinous secretion of last segment of *Laccifer (Tachardia) lacca* or Lac insect

- The insect is parasite lives and breeds on the following host plants

- **Lac Insect :**
  – They secrete a gum like substance which covered them from all the sides & after that a 1-2 inch thick layer is formed around the branches.
  – In India the largest lac producing state is Jharkhand
  – India produces 75% of the total world production
  – The lac is a secretory product of lac glands
  – The secretion covers the body of insect
  – Lac is used in printing industry, preparation of gramophone records, electrical appliances, in varnish, polish bangles, cosmetics, lacwax & lacdye
- **Composition of Lac**

FISHERIES

– Fishery is an industry devoted to the catching, processing or selling of fish, shellfish or other aquatic animals. A large number of our population is dependent on fish, fish products and other aquatic animals such as prawn, crab, lobster, edible oyster, etc., for food.

* Some of the freshwater fishes which are very common include ***Catla, Rohu* and common carp.**

* Some of the marine fishes that are eaten include – ***Hilsa*, Sardines, Mackerel** and **Pomfrets.**

– Pisciculture is rearing catching & management of fishes.

– Culture fishery is the raising of fishes in tanks & ponds.

– Capture fishery is management of catching of fish without actually raising them.

– India is at present the 6th foremost sea food producing nations in the world.

Blue Revolution is an effort to increase fish yield in India.

- **By-Product of fishing industry :**

1. **Isinglass :** It is a high grade collagen produced from air bladder or swim bladder of certain fishes like cat fishes & carps. The isinglass prepared in Russia is of best quality.
2. **Fish oil –**
   – Dry oil is obtained from Salmon & Herring.
   – Semi dry oil from carps. Liver oil contains vit A, D, E & C.
3. **Shagreen –** Skin of some fishes like shark & rays are used for covering card cases, jewel boxes, scabboards etc.

   The skin of cod salmon and other fishes are also tanned and converted into leather.
4. **MOET (Multiple Ovulation Embryo Transfer Technology)**
   – Animal is administered with FSH to induce supervulation mated with an elite bull;
   – Fertilized eggs at 8 - 32 cells stages are recovered non surgically transferred to surrogate mothers.

Main Infectious diseases of Domestic animals

Disease (s)	Pathogens	Symptoms
A. Bacterial diseases		
1. Anthrax	*Bacillus anthracis*	Blood mixed frothy secrection from external openings of body, increased respiratory rate.
2. Hemorrhagic septicaemia	*Pasteurella multocida*	High fever, pneumonia, respiratory distress, laming (pain during walking), septicemia.
3. Black quarter	*Clostridium chauvoei*	Fever, swelling in neck.
4. Brucellosis	*Brucella abortus*	Placental swelling, abortion, reduced fertility.
5. Bovine tuberculosis	*Mycobacterium bovis*	Tubercle nodes in lungs and lymph nodes respiratory distress.
6. Botulism	*Clostridium botulinum*	Paralysis of jaw, neck, leg, muscles, increased salivation, respiratory blockage.
7. Tetanus	*Clostridium tetani*	Stiffness in jaw and legs, opisthotones. (excesive strain in neck region)
B. Viral diseases		
1. Rinderpest	*Paramyxo-virus*	High fever, stomatitis, severe diarrhoea
2. Foot and Mouth Disease (FMD)	*Picorna-virus*	Fever, Lesions in mouth, hoof, mammary glands and teats.
3. Cowpox	*Orthropox-virus*	Rashes on mammary glands and teats, *low fever, reduced appetite.*
4. Rabies	*Rhabdo-virus*	Changed behaviour, high excitability, *madness, paralysis.*
C. Protozoa born diseases		
1. Babesiosis	*Babesia sps.*	Jaundice, urine red and frothy, high fever haemoglobinuria.
2. Trypanosomiasis	*Trypanosoma evansi.*	High fever, anaemia, animal lean and
3. Theileriosis	*Theileria sps.*	Swelling in lymph nodes, high fever, anaemia.
D. Helminth born diseases		
1. Ascariasis	*Neoascaris vitulorum*	Liver damage and fibrosis, swelling in lungs, intestinal obstruction
2. Fasciolasis	*Fasciola sps.*	Bleeding from liver, anaemia, fibrosis of bile duct.
3. Trichuriasis	*Trichuris sps.*	Severe diarrhorea, decreased appetite
E. Fungal diseases		
1. Ringworm	*Trichophyton sps.*	Alopecia, patches on skin, pus in infected area.
2. Aspergillosis	*Aspergillus sps.*	Lesions in lungs, respiratory system disorders, abortion.
3. Aflatoxicosis	*Aspergillus flavus*	Decreased appetite, liver damage, bloody diarrhoea, anaemia.