

Strategies for Enhancement in Food Production

1 ANIMAL HUSBANDRY

Definition:

- Agricultural practice of breeding and raising livestock useful to humans.
- Some of the products and the animals involved are :

| Useful products | Source |
|-----------------|--|
| Milk | Cows, buffaloes, Goats |
| Eggs | Poultry birds: Chicken, Ducks, Turkey, Geese |
| Meat | Cattle, Sheep, Pigs |
| Wool | Sheep |
| Silk | Silk worms |
| Honey | Bees |

- More than 70% population of livestock is in India and China but contribution to world's farm produce is 25% that result in **problem** ↓
- Productivity per unit is low
- Insufficient food supply due to ever increasing population size.

Solution ↓

- Improvement in conventional practices of animal breeding by applying biological principles.
- Application of newer technologies to Animal Husbandry

Extension of Animal husbandry → Poultry farming
→ Fisheries

2 FISHERIES

- Industry devoted to Rearing, Catching, Processing & Selling of Fish, Molluscs (shell-fish), Crustaceans (prawns, crabs), Aquatic animals
- **Aquaculture:** Enhancement in aquatic yield including plants and animals
- **Pisciculture:** Increase in total fish yield

Products from fishery

Food : lobster, prawn, fish, edible oyster

Fresh water (FW) Catla, Rohu, Common carp
Marine (M) Hilsa, Sardines, Mackerel, Pomfrets

3 MANAGEMENT OF FARM AND FARM ANIMALS

- A professional approach to boost our food production. Some of the management procedures employed in animal farm system are { Dairy farm } Management :

- Dairy farm management/Dairying:** Management of animals for milk and its products for human consumption e.g., cows, buffaloes

Aimed at
Increasing yield
Depends on ↓
Quality of breed



Improving quality of milk

High yielding potential under given climatic conditions

Resistance to diseases

led to

- Poultry farm management**

- Involves use of birds for food [Eggs Meat]
- Birds : Fowl, chicken, ducks, turkey, geese



- **Practices involved:**

- Selection of disease free and suitable breeds
- Proper and safe farm conditions
- Proper feed and water
- Maintaining proper health care and hygiene

Disease Cause Symptoms

Bird flu

H₅N₁ virus
Respiratory difficulty, fever, malaise

People at risk

- Poultry farmers exposed to infected birds.
- People who eats under cooked eggs/poultry

To meet the increasing demand on fisheries, different techniques have been employed that led to **Blue revolution**

- **Practices involved**

- Effective housing
- Adequate water
- Maintain disease free conditions
- Cattle diet (fodder)
- Quality ↑ (oil cake rich)
- Quantity balanced

Stringent cleanliness of Cattle Handlers
Regular inspection by veterinary doctor

Increased mechanisation in dairy farming particularly milking, storage and transport of milk, reduces chances of direct contact of the produce with the handler

4 BEE-KEEPING (Apiculture)

- It is the maintenance of hives of honeybees for the production of honey
- Age old, high income yield cottage industry and is not labour intensive
- Most common bee in India : **Apis indica**

Advantages

- Increases product yield
- Enhances crop yield

Products obtained from honey bee

Bees wax

- Preparation of cosmetics and polishes

Honey

- Food: High nutritive value
- Used in Indigenous medicine

Salient points for successful bee keeping

- Knowledge of the nature and habits of bees
- Selection of suitable location for keeping the beehives
- Catching and hiving of **swarms (group of bees)** during different seasons
- Management of beehives during different seasons
- Handling and collection of honey and beeswax

Bees are effective pollinators

Areas for practice

Pastures for shrubs

Crop fields

Fruit orchards

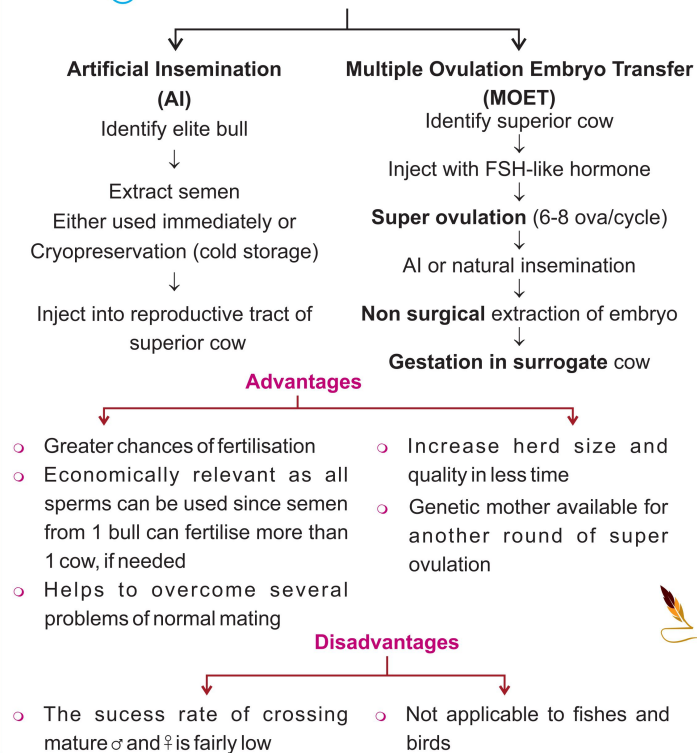
Brassica Pear Sunflower Apple

Keeping beehives in crop fields during flowering period increases pollination efficiency and yield

5 ANIMAL BREEDING

- **Breed** : A group of animals related by descent and similar in most characters like general appearance, features, size, configuration etc.
- **Aims of animal breeding:**
 - Increase the product yield (Quantity ↑)
 - Improving desirable qualities in produce and cattle
 - High yielding variety
 - Disease resistant
 - High reproductive rate
 - Longer productivity span

6 CONTROLLED BREEDING EXPERIMENTS



7 SELECTIVE BREEDING OR HYBRIDISATION

Types of selective breeding

Inbreeding

- Mating of more closely related individuals within the **same breed** for 4-6 generations
- Inbreeding increases **homozygosity** and is useful to evolve **purelines**

Advantage

- Increases the productivity of population as superior genes are accumulated and harmful recessive genes are eliminated

Disadvantages

- **Inbreeding depression (ID)** due to continued close inbreeding reduces
 - Fertility
 - Productivity

Inbreeding depression can be overcome by out crossing i.e., method to restore fertility and yield

Outbreeding

- Mating between male and female of same breed (no recent common ancestor) or different breeds or different species

2. Cross breeding

- Mating between superior male of one breed and superior female of another breed
 - This method allows combination of superior qualities of two different breeds on a commercial scale.
- ↓ **Advantage**
- Stable new breeds superior to existing breeds can be developed

- **Example:** A new breed of sheep

♂/Male Merino ram × ♀/Female Bikaneri ewe

Hisardale

- **Location** : Punjab

1. Outcrossing

Mating of animals within the **same breed** but having **no common ancestors** upto 4-6 generations

↓ Advantage

- A single out cross helps increase productivity of animals below average
 - ↑ growth rate in beef cattle
 - ↑ milk production

3. Interspecific hybridisation

- Male and female of two **different related species** are mated

↓ Advantage

- Progeny may combine desirable features of both the parents and may be of considerable economic value

- **Example:**

♂/Male Donkey × ♀/Female Horse (Mare)

Mule (Sterile)



- MOET is demonstrated on mammals such as cattle, mares, sheep, rabbits
 - **Superior cow** : High yield of milk/lactation
 - **Superior bull** : Lean meat with less lipid
- Have been bred successfully to increase herd size in a short time