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CHAPTER NOTES

Strategies for Enhancement in Food Production Class 12 Notes — CBSE Biology Chapter 9

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Strategies for Enhancement in Food Production Class 12 Notes — CBSE Biology Chapter 9

Chapter 9 — **Strategies for Enhancement in Food Production** — covers plant breeding, animal husbandry, tissue culture, and single cell protein. Carries **3-5 marks**. Mostly factual — learn the breeding methods and examples.

Key Concepts

Plant Breeding

Steps: Collection of variability → Evaluation and selection of parents → Cross-hybridisation → Selection and testing → Release of new varieties

Improved Crop Varieties in India

Crop	Variety	Achievement
Wheat	Sonalika, Kalyan Sona	Semi-dwarf, high yield (Green Revolution)
Rice	IR-8, Jaya, Ratna	Semi-dwarf (from IRRI Philippines)
Sugarcane	Saccharum barberi × S. officinarum	High yield + high sugar + thick stems
Cowpea	Pusa Komal	Resistant to bacterial blight
Brassica	Pusa Swarnim	Resistant to white rust

Biofortification

Breeding crops with higher nutritional value:

- Vitamin A enriched: Golden rice, carrots, spinach
- Iron enriched: Spinach, bathua
- Protein enriched: Atlas 66 (wheat), protein-rich beans

Tissue Culture

Totipotency: Ability of a single cell to develop into a complete organism

Micropropagation: Growing plants from tissue culture → produces somaclones (genetically identical)

Somatic hybridisation: Fuse protoplasts of two different species → hybrid plant (pomato = potato + tomato)

Animal Husbandry

- **Inbreeding:** Mating closely related individuals → increases homozygosity; continued inbreeding → inbreeding depression
- **Outbreeding:** Mating unrelated animals; includes outcrossing, cross-breeding, interspecific hybridisation
- **MOET (Multiple Ovulation Embryo Transfer):** Hormones → superovulation → many eggs → IVF → embryos transferred to surrogate mothers
- **Artificial Insemination:** Semen collected, stored, injected into female

Single Cell Protein (SCP)

- Microorganisms grown as protein-rich food source
- **Spirulina:** Cyanobacterium grown on wastewater → rich in protein, vitamins, minerals
- 250g *Methylophilus methylotrophus* → 25 tonnes of protein

Quick Revision Points

- Green Revolution: semi-dwarf wheat (Sonalika) and rice (IR-8)
- Plant breeding steps: collection → selection → crossing → testing → release
- Biofortification: Golden rice (Vit A), Atlas 66 (protein)
- Tissue culture: totipotency, micropropagation (somaclones), somatic hybridisation
- Animal breeding: inbreeding → homozygosity; outbreeding → hybrid vigour
- MOET: superovulation + IVF + embryo transfer
- SCP: Spirulina (protein-rich, grown on waste)

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