

Introduction to Animal Production

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(Key concepts, terminology, and practical considerations for students and professionals)

1. What Is Animal Production?

Aspect	Description
Definition	The science and practice of raising domesticated animals for food, fiber, labor, and other products.
Main Sectors	- Livestock (cattle, sheep, goats, pigs, poultry, rabbits) - Aquaculture (fish, crustaceans, mollusks) - Apiculture (bees)
Objectives	- Maximize quantity and quality of output (meat, milk, eggs, wool, etc.) - Ensure animal health and welfare - Optimize resource use (feed, water, land) - Minimize environmental impact - Maintain economic viability for producers

2. Basic Principles of Animal Production

Principle	Practical Implication
Genetics & Breeding	Selection of high-performing breeds, cross-breeding, and modern tools (AI, embryo transfer, genomic selection).
Nutrition	Balanced rations that meet energy, protein, mineral, vitamin, and water requirements for each life stage.
Health Management	Preventive medicine (vaccination, biosecurity), early disease detection, parasite control.
Housing & Environment	Adequate space, ventilation, temperature control, lighting, and bedding to reduce stress.
Reproduction Management	Timed breeding, estrus detection, artificial insemination, and proper kidding/lambing/parturition care.

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Principle

Practical Implication

Animal Welfare	Handling practices that minimize pain and fear; meeting legal and ethical standards.
Sustainability	Efficient feed conversion, waste recycling, greenhouse?gas mitigation, and responsible land use.

3. Major Animal Species and Their Production Systems

Species	Primary Products	Typical Production Systems
Cattle	Beef, milk, leather	- Extensive grazing (pasture) - Semi?intensive (pasture + supplemental feed) - Intensive (confined feedlots, dairy barns)
Sheep & Goats	Meat, milk, wool/fiber, hides	- Pasture?based - Mixed crop?livestock - Intensive (controlled housing)
Swine	Pork, leather	- Farrow?to?finish (all?in?one) - Farrow?to?nursery + grow?out - Outdoor/organic systems
Poultry	Meat (broilers), eggs, feathers	- Battery cages (egg layers) – being phased out in many regions - Free?range, enriched cages, aviary systems - Broiler houses with controlled climate
Rabbits	Meat, fur	- Cage systems (indoor) - Free?range (outdoor runs)
Aquaculture Species	Fish, crustaceans, mollusks	- Pond, cage, recirculating aquaculture systems (RAS), flow?through tanks
Bees	Honey, pollen, wax, pollination services	- Apiaries with movable frames; managed for honey production or pollination

4. Nutrition Fundamentals

1. Feed Types

- **Forages** (pasture, hay, silage) – primary energy source for ruminants.

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- **Concentrates