Short note unit 6 Beef cattle production and management

Beef Cattle Breeds in Tropical Countries

No specialized beef breeds exist in tropical regions. However, breeds like Boran, Africander, Brahman, Gir, Nelore, Guzerate, Red Sindhi, Indo Brazilian, and Ankole Watusi are used for beef production due to their desirable traits, including high carcass percentage, dressing percentage, and meat quality. These breeds are also crossbred with local cattle to enhance productivity.

Key Characteristics of Common Breeds:

1. Boran (Southern Ethiopia):

Purpose: Mainly meat.

Features: Hardy, excellent meat quality, small to medium size.

Weight: Bulls (250–850 kg), Cows (225–355 kg).

Tolerance: Native climates.

Coat Color: Black, fawn, red, white.

2. Brahman (India):

Purpose: Meat, milk, drought.

Features: Heat tolerant, insect resistant, hardy.

Weight: Bulls (800–1000 kg), Cows (500–700 kg).

Tolerance: All climates.

Coat Color: Gray, red, and other variations.

3. Africander (South Africa):

Purpose: Mainly meat.

Features: Tick resistant, well muscled, good temperament.

Weight: Bulls (820–1090 kg), Cows (450–600 kg).

Tolerance: Native climates.

Coat Color: Deep red.

Temperate Cattle Breeds

Breeds like Hereford, Angus, and Shorthorn are common in temperate zones (USA, Europe) and are well known for beef production.

Hereford (England):

Purpose: Meat.

Features: Hardy, adaptable, medium to large size.

Weight: Bulls (~1200 kg), Cows (~800 kg).

Tolerance: All climates.

Coat Color: Dark red to red yellow.

Angus (Aberdeen Angus)

Primary Purpose: Meat production.

Special Characteristics:

- ★ **Very hardy and strong.**
- ★ **Well adapted to cold climates.**

Size: Medium to large.

Bull's Weight: ~850 kg.

Cow's Weight: ~550 kg.

Climate Tolerance: Adaptable to all climates.

Coat Color: Black or red.

Horned: Naturally polled (hornless).

Milk Yield: Poor.

Place of Origin: Scotland.

Charolais

Primary Purpose: Meat production (main) and draught work.

Special Characteristics:

- ★ **Extremely hardy and strong.**
- ★ **Easy calving with excellent maternal qualities.**
- ★ **Produces high quality meat.**

Size: Large.

Bull's Weight: ~1100 kg.

Cow's Weight: ~900 kg.

Climate Tolerance: Adapted to native climates.

Coat Color: Mainly white.

Horned: Can be horned or polled.

Milk Yield: Poor.

Place of Origin: France.

Beef Cattle Traits

1. Traits for Selection

Weaning weight: Indicates growth potential of calves and milking ability of dams.

Dressing percentage: Ratio of dressed carcass weight to live weight.

Birth weight: Calf weight at birth.

Pre /Post weaning weight: Taken before/after weaning to assess growth.

Yearling weight: Measures growth from birth to ~1 year (320–410 days).

Carcass traits: Include weight, grade, fat thickness, loin eye/rib eye area, tenderness, marbling, and meat quality.

2. Carcass Traits

Quality traits: Marbling, fat thickness, ribeye area, yield grade.

Quantity traits: Live weight, hot carcass weight, dressing percentage.

Beef Cattle Selection Methods

Selection improves genetic traits in herds for high meat yield, quality, growth rate, and disease tolerance.

Selection criteria: Foraging ability, feed intake, growth, meat quality, and heat resistance.

Beef Cattle Feeds and Feeding Methods

1. Feed Types

- ★ **Dry feeds: Hay, grains, oilseed meals, straws.**
- ★ **Green feeds: Pasture, green chop.**
- ★ **High moisture feeds: Silage, roots, tubers, wet byproducts.**

2. Feeding Methods

Nutrient requirements vary based on maintenance, reproduction, and production.

Nutritional factors include age, weight, breed, production level, activity, environment, and physiological status.

Feed adjustments are made for conditions like pregnancy, lactation, and weather stress.

Key Terms

Feedlot: Intensive feeding system for beef cattle prior to slaughter.

Beef Cattle Housing and Disease Management

1. Beef Cattle Housing

Orientation: East west direction minimizes exposure to sun and rain.

Roof Design: Gable roof preferred for better heat and cold protection.

Predominant Systems:

Open Overhead Shelter: Common in Ethiopian commercial cattle fattening.

Open Enclosures: Used in medium and small scale fattening farms.

2. Major Diseases of Beef Cattle

Types:

Infectious: Viral, bacterial, protozoal diseases.

Parasitic: Internal and external parasites.

2.1 Viral Diseases

1. Rinderpest (RP)

- ✓ **Symptoms: Fever, nasal discharge, bloody diarrhea, rough coat.**
- ✓ **Transmission: Direct contact with infected animals.**
- ✓ **Prevention: Vaccination, sanitation, destruction of infected animals.**

2. Foot and Mouth Disease (FMD)

- ✓ **Symptoms: Vesicles on feet, mouth, and teats; lameness; drooling.**
- ✓ **Transmission: Contact with infected secretions or aerosols.**
- ✓ **Prevention: Vaccination.**

3. Rabies

- ✓ **Symptoms: Restlessness, aggression, paralysis, excessive salivation.**
- ✓ **Transmission: Bite from rabid animals.**
- ✓ **Prevention: Vaccination, movement restrictions.**

4. Bovine Viral Diarrhea (BVD)

- ✓ **Symptoms: Fever, diarrhea, reduced milk production, abortions.**
- ✓ **Transmission: Contact with infected animals or contaminated materials.**
- ✓ **Prevention: Vaccination two weeks before movement.**

Disease Control

- ✓ **1. Vaccination Programs: Regular vaccination for diseases like RP, FMD, rabies, and BVD.**
- ✓ **2. Biosecurity: Prevent disease spread by isolating sick animals, cleaning housing, and managing animal movements.**
- ✓ **3. Early Detection: Monitor for symptoms to control outbreaks quickly.**
- ✓ **4. Proper Housing: Ensure clean, ventilated, and stress free housing to reduce disease risk.**

Bacterial Diseases in Cattle

Contagious Bovine Pleuropneumonia (CBPP)

- ✓ **Cause : Mycoplasma mycoides var. mycoides**
- ✓ **Symptoms : Fever, loss of appetite, coughing, shallow respiration, extended neck, arthritis**
- ✓ **Transmission : Aerosol and droplet infection; carriers can shed the bacteria**
- ✓ **Treatment : Tylosin and danofloxan (in endemic areas)**
- ✓ **Prevention : Vaccination**

Bovine Tuberculosis (TB)

- ✓ **Cause : Mycobacterium bovis**
- ✓ **Symptoms : Low grade fever, chronic cough, difficulty breathing, emaciation, swollen lymph nodes**
- ✓ **Transmission : Inhalation, infected milk**
- ✓ **Treatment : Antibiotics**
- ✓ **Prevention : No effective prevention**

Anthrax

- ✓ **Cause : Bacillus anthracis**
- ✓ **Symptoms : Sudden death, tarry blood, swelling of throat and neck, convulsions**
- ✓ **Transmission : Inhalation, ingestion, skin wounds, biting flies**
- ✓ **Treatment : Antibiotics**
- ✓ **Prevention : Vaccination, carcass disposal (burning/burial with quicklime)**

Black Leg

- ✓ **Cause : Clostridium chauvoei**
- ✓ **Symptoms : High fever, lameness, muscle inflammation, rapid breathing**
- ✓ **Transmission : Ingestion during grazing, found in soil and digestive tract of healthy animals**
- ✓ **Treatment : Ineffective**
- ✓ **Prevention : Vaccination of calves; carcass condemnation**

Diseases Caused by Protozoa

Trypanosomiasis

- ✓ **Cause : Tsetse fly transmission**
- ✓ **Symptoms : Fever, weakness, anemia, reduced fertility, and milk production**
- ✓ **Transmission : Tsetse flies**
- ✓ **Treatment : Trypanocidal drugs (e.g., diminazene aceturate)**
- ✓ **Prevention : Killing parasites/vectors with insecticides**

Coccidia

- ✓ **Symptoms : Loss of appetite, diarrhea, dehydration, abdominal pain**
- ✓ **Transmission : Fecal oral route; contaminated feed/water**
- ✓ **Treatment : Antibiotics**

- ✓ **Prevention : Clean water tanks, disinfect feed bunks, reduce overcrowding, manage manure**

Cryptosporidium

- ✓ **Cause : Cryptosporidium parvum**
- ✓ **Symptoms : Watery diarrhea, stomach cramps, dehydration, fever, weight loss**
- ✓ **Transmission : Fecal oral route; contaminated food/water**
- ✓ **Treatment : Antiprotozoal drugs**
- ✓ **Prevention : Clean housing/equipment, frequent bedding changes**

Parasites

Impact : Blood sucking, nutrient competition, significant economic loss due to reduced productivity

Animal Diseases, Control Strategies, and Meat Production in Ethiopia

Animal Parasites

- ✓ **Internal Parasites : Nematodes (round worms), tapeworms, liver flukes. Infected through grazing lands.**
- ✓ **External Parasites : Horn flies, face flies, stable flies, grubs, ticks, lice, mites.**

Disease Control in Beef Cattle

- ✓ **Strategies : Risk based surveillance, proper disease diagnosis, quality vaccines, functional veterinary services, animal house cleaning, proper drainage, rotational grazing.**
- ✓ **Treatment : Vaccines, anthelminthic drugs.**

Meat Production in Ethiopia

Sources : Old oxen, culled cows, surplus young bulls.

Statistics :

- ✓ **Average live weight: 250 kg**

- ✓ **Offtake rate: 14%**
- ✓ **Carcass weight: 110 kg**
- ✓ **Dressing percentage: 44%**

Challenges : Production issues, husbandry practices, marketing difficulties.

Trends :

- ✓ **2004: 578,240 tons**
- ✓ **2010: 749,430 tons increased but**
- ✓ **2017: 597,765 tons decreased**

Contribution :

- ✓ **0.2% of the world's total meat production.**
- ✓ **Annual beef production: ~1 million tons (USD 5.1 billion).**
- ✓ **Ruminants: >3.2 million tonnes (>72% of total meat production).**

Meat Processing

Steps :

- ✓ **Slaughtering**
- ✓ **Processing carcasses (cutting, inspecting, packaging)**

Technologies :

- ✓ **Physical/Technical Processes : Cutting, chopping, mixing, tumbling, stuffing, heat treatment.**
- ✓ **Chemical/Biochemical Processes : Salting, curing, utilization of spices, smoking, freezing, drying.**

Key Points :

- ➢ **Ethiopia has a large livestock population but low meat production.**
- ➢ **Main issues include low offtake rates and inability to meet international standards.**

- **Meat processing involves various physical and chemical methods to ensure marketability and safety.**

Meat Canning

Process Overview :

- **1. Pasteurization : Accepts the survival of heat resistant microorganisms.**
- **2. Sterilization : Aims to destroy all contaminating bacteria and spores to ensure safety.**

Essential Operations :

- **1. Heating : The product must be heated to a high temperature for a sufficient duration to make it fully or commercially sterile.**
- **2. Sealing : It must be sealed in a hermetic container to prevent recontamination.**

Target Bacteria :

Clostridium botulinum : An anaerobic, rod shaped, spore forming bacteria responsible for foodborne botulism.

Botulism Symptoms :

- **Muscle weakness**
- **Double vision**
- **Difficulty breathing**
- **Paralysis**

Key Points :

- **Sterilization : Critical for inactivating large numbers of spores.**
- **Prevention : Proper canning processes are essential to prevent botulism.**