Game Bird Management

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Game Bird versus game fowl
Small operations / specialty markets
Little integration, some cooperatives
Variation state by state
Multipurpose: consumption, hunting, decorative

Quail
Bob White, Japanese quail (coturnix coturnix japonica), Tennessee Red, cross breeds
Markets: hunt clubs, research, restaurant, specialty markets
Many states require a Fish and Game permit to raise
Illegal to raise native quail (California, Mountain, etc)
Approximate US yearly production: 37 million
Most operations have both breeders and market birds.

Bob Whites used predominantly for hunt clubs, Japanese and mixed breeds for meat.

Quail destined for hunt clubs are usually smaller (6-7 ounces) because it is more active, better flyer.

Advisable to introduce new breeder stock every 3 years to prevent inbreeding problems.

In cold climates, overwinter in pens of 20 or more to maintain warmth.

Wire floors preferred to prevent intestinal parasites.

Test for Salmonella pullorum prior to breeding.

Pair breeders 4-6 before breeding season.

Ratio of 1 cock : 2-3 hens to reduce overmating, cannibalism.

Three types of management systems: Large community floor pens, smaller colony pens 10-20 birds each, individual cages of pairs or trios.
Use individual cages or separate cages with a solid partition to keep males from fighting.

Typical cage size 12 X 24, floor 1/2 x 1 in.

Floor pens least desirable, hard to collect eggs, lower hatchability, lower chick quality.

Too small cages increases cannibalism.

Minimum .5 square ft / bird in cages.

Indoor breeding / year round production use 14-18 hr day.

Optimal ambient temperature 60° - 85°.
Bob Whites begin consistent egg production about 22 weeks of age, Japanese at 6 weeks with full production by 50 days of age.

Lighting augmentation starts at 19 weeks.

Typical Bob White production per hen: no light supplementation: 50-100 eggs, 17 hr light normal mating season: 70-150 eggs, year round: 150-200+, Japanese 200-300 eggs in 1-2 years.
Game Bird Management
Quail management / egg incubation

- Bob Whites incubation time 23-24 days, Japanese 16-17 days
- Temperature for incubation: 99.5°F, 60% humidity, turn every 2-4 hours; hatching 99°F, 70-75% humidity, no turning
- Candle mid-incubation to assess fertility, swab deads for disease assessment
- Hatching trays need rough bottom to prevent splay leg in hatchlings

Game Bird Management
Quail management / brooding

- Hatchlings are very small, must use waterers that prevent drowning
- Supplement heat for 1st 4 weeks
- Brooder guard must be removed at first sign of flying
- Cages need 1/4 floor wire to prevent leg entrapment
- Bob Whites used for hunt clubs are sold at 15-16 weeks of age
Game Bird Management

Chukar partridge

- Native of Asia, Middle East, southern Europe
- Markets: Predominantly restaurant in California, hunt clubs elsewhere
- Less expensive to raise / obtain than Hungarian partridges
- Eggs or day-old chicks relatively easy to obtain
- Must custom slaughter
- Approximate US production/year is 4 million
Game Bird Management
Chukar partridge / incubation & hatching
- Source NPIP or Salmonella / Mycoplasma free breeders
- Incubation period 23-25 days
- Eggs can handle relatively long storage times
- Incubate at 99.5°F (19-20 days), hatcher 99°F
- 2 mortality peaks during incubation: ED3-5 & ED20-24
- Chicks need augmented heat first 2 weeks
- Cage brooding can be done for short periods initially but will affect feather quality

Game Bird Management
Chukar partridge / Production
- Feed commercial turkey starter
- Birds destined for hunt clubs should be moved to wire floored flight pens shortly after end of heat augmentation
- Flight pens need 2 square ft per bird
- Hunt club birds generally sold at 15-16 weeks
- Meat birds sold at 20 weeks / 1 lb processed wt.
- Natural daylight only for flight cages, intermittent light for meat birds
Game Bird Management
Chukar partridge / Breeders

- Secondary sex characteristics minor – difficult to sex, vent sexing best
- Ratio of 1 male : 3 or 4 females
- Floor pens with nest boxes most economical
- Stimulate lay at 30 weeks of age, can produce for 2 years with 2 laying cycles per year
Game Bird Management

Pheasant

- Commercial production is usually Ringneck, fanciers: Amherst, Reeves, Golden
- Markets: hunt clubs, restaurant, specialty markets
- Many states require a Fish and Game permit to raise
- Approximately 10 million pheasants produced / year in US
- Considered an indigenous bird to US but originally from Asia
Game Bird Management
Pheasant / Incubation, hatching, rearing

- Standard incubation conditions, 23-25 days
- Augment heat at least 2 weeks
- Can cage rear initially, then move to flight pens
- Extremely active, prone to cannibalism
- Flight pens need 10-15 square feet / bird
- Provision of cover is preferred if inspected regularly
- Flight pens without cover support fewer birds
- Market to hunt clubs at 12-16 wks of age
Meat birds are generally confined in colony cages with wire floor, 5 sq ft / bird. May need spectacles / hoods / beak trimming. Larger strains for meat production are the jumbo ringneck or buff ringneck. Dressed market wt males 2-2.5 lbs, females 2-2.25 lbs, live wt 3-3.5 lbs, usually reached by 16-18 wks of age. Mature size 4.75 lbs (hens), 5.5 lbs (roosters).
Game Bird Management

Pheasant / Breeding

- Seasonal breeders, lay eggs April-June unless light augmented
- Outside pens with nest boxes (usually don’t use), 25-30 sq ft / bird
- Average hen production 40-50 eggs (light augmented), 15 / bird natural
- Flocks are usually replaced yearly
- Vaccinate for Marble Spleen Disease
Commercial production is usually Pearl Helmeted type, also have White and Lavender
Markets: Restaurant, specialty markets
Few keet producers
Approximately 4 million Guinea fowl produced / year in US
Native to Africa, territorial, flighty
Can be tamed
**Game Bird Management**

**Guinea Fowl / incubation, rearing**

- Standard turkey incubation conditions, 26-28 days
- Keets are brown, get adult feathering about 2 months of age
- Use surrogate chicken hens or artificially brood as Guinea hens are notoriously poor parents
- Can be raised outside at 6-8 weeks of age

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**Game Bird Management**

**Guinea Fowl / incubation, rearing**

- Indoor housing = extremely dusty environment
- Provide cover
- Market at 16-18 weeks of age, live weight 2.75-3.5 lbs, target for dressed wt of 2 lbs
Game Bird Management
Guinea Fowl / breeding
- Egg production with augmented light & cages = 170 / 36-40 wk production period, conventional floor 50-100 eggs / 24 wk production period
- Commercial breeders 2-3 yrs, fanciers 4-5 yrs
- In outside pens, frequently “loose” nests and keets
- Eggs weigh about 1.4 oz (chicken eggs about 2 oz)
- Ratio 1 male / 4-5 hens, can be artificially inseminated

MARBLE SPLEEN DISEASE
Occurrence, Transmission, Morbidity and Mortality
- Type II adenovirus causes HE in turkeys and marble spleen disease in pheasants
- Primarily in confinement reared pheasants 3-8 months of age
- First reported in 1966 in ringnecks
- US, Canada, Europe, Australia and Korea
- Mortality 5-20% over a period of 10 days - several weeks
MARBLE SPLEEN DISEASE
Occurrence, Transmission, Morbidity and Mortality, cont.

- Also infects chickens, guinea fowl and psittacines
- Oral transmission
- May be refractive to infection under 4 weeks of age
Clinical signs include listlessness, sudden death, dyspnea, weakness, rare nasal discharge.

Gross lesions include marbled spleens and edematous and congested lungs.

**Diagnosis**

- VI from spleen
- AGP using dilated splenic material and anti-HEV serum
- PCR
**MARBLE SPLEEN DISEASE**

**Prevention and Control**

- Vaccination with commercially available products or crude splenic homogenates
- Water vaccination
- No treatment but turkeys have been treated with 0.5-1 ml of antiserum obtained from healthy flocks at slaughter injected SC or IM

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**TRICHOMEONIASIS**

**Occurrence, Transmission, Morbidity and Mortality**

- Called canker in pigeons for the yellow button shaped lesions (Frounce in falcons)
- Commonly affects doves, chickens, chukars, raptors and turkeys
- Approximately 80% of pigeons are infected
- Worldwide distribution
- Adults are asymptomatic carriers

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**TRICHOMEONIASIS**

**Occurrence, Transmission, Morbidity and Mortality, cont.**

- Young (2-5 wks) have severe and often fatal disease
- Direct transmission from infected lesions, particularly crop milk
- Small lesions in oral mucosa predispose
- Stress and infecting dosage important factors
TRICHOMONIASIS
Occurrence, Transmission, Morbidity and Mortality, cont.

- Incubation period 4-14 days
- High morbidity and mortality in young
- Transmission in raptors is through infected prey
- Contaminated surface water for chickens and turkeys

TRICHOMONIASIS
Diagnosis

Trichomonas gallinae or columbae

- Clinical signs include listlessness, ruffled feathers, diarrhea, emaciation, spillage of crop milk after feeding, sour crop, polydypsia and anorexia
- Adults may be reluctant to open mouth
- Gross lesions: caseous lesions in mouth, swollen wattles, caseous lesions at navel and in viscera, particularly the liver
- Direct smear of lesions, crop and demonstration of protozoan
- DD = dipheritic pox
TRICHOMONAS
Prevention and Control

- Eliminate carriers
- Organism is labile and disinfection can be used
- Change water and clean out waterers regularly
  - Do not use pigeons or doves as bait for raptors
  - No approved treatment / Flagyl 30 mg/kg orally for 5 days: ILLEGAL for chickens and turkeys!!

QUAIL BRONCHITIS
Occurrence, Transmission, Morbidity and Mortality

- Type I adenovirus
- Acute respiratory disease of Bobwhite quail
- First reported in 1950 in US in captive quail, probably in wild quail also
- Virus related to CELO (chick embryo lethal orphan) virus - widespread in chickens - hazard to quail near chickens?
- Vertical & horizontal transmission
QUAIL BRONCHITIS
Occurrence, Transmission, Morbidity and Mortality

- Most severe in young quail under 4 weeks, mild or subclinical over 8 weeks
- Incubation period 2-7 days, disease course 1-3 weeks
- Virus is resistant - see in successive flocks on contaminated premises
- Morbidity 100%, mortality 10-100%

QUAIL BRONCHITIS
Pathogenesis

- Clinical signs:
  - Sudden onset of severe respiratory signs
  - Tracheal rales, coughing, sneezing, tearing, conjunctivitis and occasionally neurologic signs
- Gross Lesions
  - Tracheal & bronchial mucous, thickening of mucosa, same with air sacs
  - Corneal cloudiness, conjunctivitis, congestion of nasal passages, infraorbital sinuses
QUAIL BRONCHITIS
Pathogenesis
- Microscopic Lesions:
  - Mild to moderate epithelial deciliation & hyperplasia of respiratory epithelium
  - Mononuclear cell infiltration of tracheal and bronchial lamina propria
  - Intranuclear inclusions in respiratory epithelium early in infection

Pathogenesis

QUAIL BRONCHITIS
Diagnosis
- History and clinical signs
- IN inclusion bodies on microscopic examination
- Confirmation by isolation from trachea, air sacs, lungs in embryonating eggs via allantoic injection
- Serologic testing of limited value unless rising titers can be shown - AGP, VN

Diagnosis

QUAIL BRONCHITIS
Prevention and Control
- Monitor breeding stock with strict isolation of chicks
- No vaccines are licensed
- No treatment
- Increase temperature, eliminate drafts, expand floor space

Prevention and Control