

Game Bird Management

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Game Bird Management

General

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

Game Bird Management

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







Game Bird Management

Quail management

- ▶ 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



Game Bird Management

Quail management / breeders

- ▶ 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





Game Bird Management
Quail management / breeders

- ▶ 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°



Game Bird Management
Quail management / breeders

- ▶ 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





Game Bird Management
Pheasant / Incubation, hatching, rearing

- ▶ 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



Game Bird Management

Guinea Fowl

- ▶ 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

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



MARBLE SPLEENS DISEASE

Diagnosis

- ▶ Clinical signs include listlessness, sudden death, dyspnea, weakness, rare nasal discharge
- ▶ Gross lesions include marbled spleens and edematous and congested lungs

MARBLE SPLEENS DISEASE

Diagnosis, cont

- ▶ VI from spleen
- ▶ AGP using diluted 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

TRICHOMONIASIS

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

TRICHOMONIASIS

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.

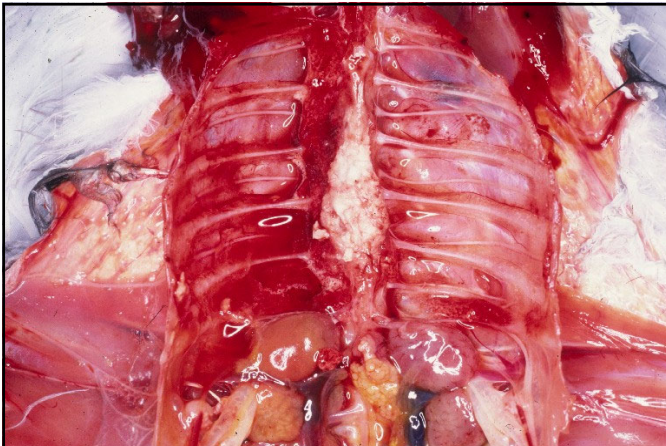
- ▶ Incubation period 4-14 days
- ▶ High morbidity and mortality in young
- ▶ Transmission in raptors is through infected prey
- ▶ Contaminated surface water for chickens and turkeys

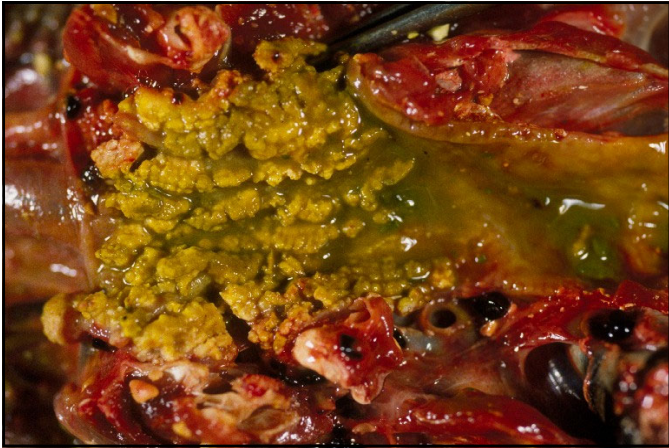
TRICHOMONIASIS

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 = diphtheritic 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

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

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

Questions?