Agri Articles
(e-Magazine for Agricultural Articles)
Volume: 04, Issue: 02 (MAR-APR, 2024)
Available online at http://www.agriarticles.com
©Agri Articles, ISSN: 2582-9882

Exploring Poultry Farming: Principles and Practices

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Poultry farming involves the domestic or commercial raising of birds, primarily for the production of meat and eggs, as well as for feathers. The main focus is on chickens, turkeys, ducks, and geese, while guinea fowl and squabs (young pigeons) are more regionally significant. This article will delve into the principles and methods of poultry farming, addressing various aspects such as housing, nutrition, health management, and breeding practices. For detailed information on the nutritional value and processing of poultry products, please refer to discussions on egg and poultry processing.

Commercial Poultry Feeding

Feeding: Commercial poultry feeding is a meticulously refined discipline, aimed at optimizing energy intake for growth and fat production. Through the utilization of high-quality, well-balanced protein sources, poultry producers achieve maximum muscle, organ, skin, and feather development. Essential minerals play a crucial role in bone strength and egg production, with approximately 3 to 4 percent of live bird composition and 10 percent of egg content attributed to minerals. Key minerals include calcium, phosphorus, sodium, chlorine, potassium, sulfur, manganese, iron, copper, cobalt, magnesium, and zinc.

Moreover, a spectrum of vitamins is essential for poultry health and productivity, including vitamins A, C, D, E, K, and the B complex. Antibiotics are commonly employed to stimulate appetite, manage harmful bacteria, and prevent disease outbreaks.

In modern poultry farming, efficient feeding practices result in approximately 0.5 kg (1 pound) of broiler meat produced from around 0.9 kg (2 pounds) of feed, while a dozen eggs are generated from 2 kg (4.5 pounds) of feed.

Diseases: Poultry species face significant susceptibility to various diseases, including but not limited to fowl typhoid, pullorum, fowl cholera, chronic respiratory disease, infectious sinusitis, infectious coryza, avian infectious hepatitis, infectious synovitis, bluecomb, Newcastle disease, fowl pox, avian leukosis complex, coccidiosis, blackhead, infectious laryngotracheitis, infectious bronchitis, and erysipelas (Saif *et al.*, 2008).

Effective disease management in poultry production involves a multifaceted approach. This includes the implementation of strict sanitary precautions, intelligent administration of antibiotics and vaccines, and the widespread adoption of confinement systems such as cages for layers and broilers (Smith *et al.*, 2015).

Avian Influenza Outbreaks: Transmission Dynamics and Risks: Since its first detection in humans in 1997, outbreaks of bird flu, or avian influenza, have necessitated the culling of millions of poultry animals globally (Alexander, 2007). Waterfowl, particularly wild ducks, are considered primary hosts for all bird flu subtypes, harboring the viruses in their intestines and dispersing them into the environment through feces (Kida *et al.*, 1994). Although wild birds are typically resistant to these viruses, they serve as vectors for transmission to susceptible domestic birds. Infected birds transmit the viruses to healthy individuals through various means, including saliva, nasal secretions, and feces (Capua & Alexander, 2009).

Within a localized region, bird flu spreads easily from farm to farm via airborne feces-contaminated dust and soil, contaminated clothing, feed, equipment, and through contact with wild animals carrying the virus (Swayne & Halvorson, 2008). Furthermore, the disease can disseminate across regions through the migratory patterns of birds and international trade in live poultry (Kilpatrick *et al.*, 2006).

Individuals at the highest risk of infection include those in close contact with sick birds, such as poultry farmers and slaughterhouse workers (Capua & Alexander, 2009).

Management of Poultry Farm: Poultry farming, particularly the housing of Single-comb White Leghorn hens for egg production in multitier layer houses, emphasizes a meticulously controlled environment to ensure optimal conditions and minimize stress factors. To address issues like cannibalism, which manifests as toe, feather, and tail picking, management practices include debeaking at one day of age and other preventive measures. Mechanized operations for feeding, watering, egg collection and cleaning streamline efficiency and reduce labor requirements.


The use of wire cages, typically housing two to three birds per cage, arranged in three to four tiers, is common practice. This setup not only saves space but also enhances production outcomes, lowers mortality rates, reduces cannibalism, minimizes feeding requirements, mitigates diseases and parasites, improves culling practices, and optimizes space and labor utilization.

Poultry breeding exemplifies the application of genetic principles such as inbreeding and crossbreeding, coupled with intensive mass selection, to expedite meat production and maximize egg yields. Leveraging heterosis, or hybrid vigor, through incrosses and crossbreeding, has yielded rapid weight gains and high-quality meaty carcasses.

The United States stands out for its advanced chicken breeding industry, characterized by intensive nutritional research, improved breeding stock, strategic management practices, and scientific disease control measures. These efforts have resulted in the production of modern broilers of consistently high quality at increasingly lower costs. Contemporary broiler chicks can attain a market weight of 2.3 kg (5 pounds) in just five weeks, compared to the four-month duration required in the mid-20th century. Furthermore, there has been a remarkable increase in annual egg production per hen, rising from approximately 100 eggs in 1910 to over 300 in the early 21st century.

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