Egypt Poult. Sci. Vol (25) (I): (1-11)

Guinea Fowl: A Review

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Accpted : 05/01/2005

INTRODUCTION

Guinea fowl is considered as an one of adapted poultry species in different countries overall world. Guinea fowl reared much earlier and kept as a game bird or a semi-domesticated one around the houses. Several experiments had done after domestication guinea fowl for characterizations and requirements. First reports about its breeding in European countries were published at the beginning of the 20th century. Guinea fowl do make good companion birds as they tend to be non aggressive to birds of a similar size and do not carry many of the diseases and germs that in chickens, turkeys, ducks and geese are susceptible. Its excellent meat quality, very good ability to adapt to different conditions, resistance, wild and seeking habit and low costs of keeping make guinea fowl as one of the best poultry species for natural production (Szalay, 2002).

Some Advantages:

Guinea fowl are excellent insectivors and will seek out ticks, beetles, worms, grasshoppers and all other insects better than most other poultry. We have sold many Guinea Fowl as aids in controlling deer ticks, grasshoppers which defoliate chestnut and pecan trees, and other such insects.

1- Guinea fowl are also used as "watchdogs," alerting their owners to predators, stray dogs and cats, wild animals, hawks, owls, snakes and strangers. Provided with the proper night lighting, Guinea Fowl send their calls of alarm at the slightest disturbance.

2- Guinea fowl are compatible with all types of poultry, making them useful and interesting additions to a mixed flock. Completely hardy in all climates, a modest shelter will keep your birds comfortable.

3- Guinea fowl are excellent table fowl as well, considered a delicacy in many European countries. The Pearl has darker meat, but many of the mutations have light meat. The meat is similar to that of pheasant.

Classification:

There is much debate on the taxonomy of Guinea fowl. Some authors class them in the family Phasianidea and others give them their own family, Numidiadea.

Class	Avis
Order	Galiformes
Family	Numidiadea & Phasianidea

Genus Agelasts

This genus consists of two primitive species, quite unlike other Guinea fowl. They are unspotted, have bare red heads and overall black plumage. They inhabit rain forests of western Africa and are not currently kept in acviculture.

Two species:

- White-breasted Guinea fowl (A. Meleagrides)
- Black Guinea fowl (A. Niger)

Genus Numida

The Helmeted Guinea fowl is the ancestor of all domestic Guinea fowl. There is only one species in the genus, but with as many as 30 subspecies described (many are debated, possibly only 9 truly recognized). The overall plumage is much like domestic Guinea fowl, overall spotted with a bare head and horny casque on the head (varies among subspecies). They are native to scrublands and savannahs in most of Africa South of the Sahara.

One species:

- Helmeted Guinea fowl (N. Meleagis)

Genus Guterra

There is some debate among ornithologists on how many species are in this genus. Some list the two species of crested Guinea fowl as one species, with Edouardi being a subspecies. They are generally spotted like the previous genus, but instead of a casque, have a bushy black crest on their heads. The plumed species is very rare in captivity, but the two crested are well established.

Three species:

- Plumed Guinea fowl (G. Plumifra)
- Kenya Crested Guinea fowl (G. Bucherani)
- Crested Guinea fowl (G. Edouardi)

Genus Acryllium

A very unusual, but beautiful species is the sole member of this genus. The Vulturine Guinea fowl is very popular with aviculturists and is well established in captivity. Named for their vulture-like head and face, they have long tails and elegant white plumes on the throat and back. found in the Savannah of East Africa.

One species:

- Vulturine Guinea fowl (A. Vulturinum)

Rearing:

Guinea youngs are called *keets*. They are very active birds right from the start and may amaze you with just how active and fast they are. They are smaller than full size chicks and precautions should be taken to contain them as they will go right through 1" poultry mesh.

Being native to dry areas of Africa, the keets do not tolerate being wet. If you are raising keets with a Guinea hen or foster hen, keep them in the pen until the dew is off the grass each morning. Guineas make poor mothers and often abandon keets that get separated during their daily trips through tall grass. It is not unusual for a hen to lose 75% of her brood during the first two weeks because of this.

Keets can also be brooded on the floor or in cages, either way works well for guineas. The surface of the floor and feed pans should provide good traction for the newly hatched keets. Guineas have weaker legs than chickens and should never be brooded on newspaper or any slick surface. On smooth surfaces, they have a tendency to go "spraddle-legged" in an extremely short time. Once a leg gets twisted out from under them, it is almost impossible to get the bird to walk normal again. We recommend placing keets on 1/4" or 3/8" hardware cloth because the small holes allow the birds to get traction, but do not let them fall through. 1/2" wire is too large and the birds will get their legs caught quite often. Start brooding temperatures out at 95 degrees F and decrease the temperature 5 degrees each week. Depending on the temperature in the brooding area and the

number of birds you have together, you can usually discontinue the heat after 6-8 weeks.

Adults:

Adult guineas require very little care and do very well on their own. Clean water and a regular laying mash is all you need to feed them. They enjoy a little scratch mixed in their feed and scattered on the ground. They don't care for the larger grains and will ignore whole corn kernals. We have found that our birds favor wheat and will pick up every grain we put out. If your birds are allowed to room freely they will eat very little during the summer months. If you have plenty of bugs and seeds you will start wondering if they are even touching their feed at all.

Diet and Nutrition:

Guinea fowl thrive on a diet similar to that of other poultry. A good laying mash, crumble, or pelleted feed sold for chickens or game birds is a complete and total diet. Grit and additional treats should be provided if the guinea fowl are penned. The addition of water soluable vitamins is recommended.

Nutrition Program:

- From (0-4 weeks) 12.3 MJ / kg – 23% P
- From (5-8 weeks) 12.5 MJ / kg – 19% P
- From (8-16 weeks) 12.1 MJ /kg – 16% P
- During Production 16% P

Personal Communication (Szalay, 2004)

Guinea fowl are excellent foragers if allowed to range and will sustain themselves on a diet of grasses, grass seeds, insects, etc. Though they have a tendency to wander, a daily routine of feeding treat foods (e.g., moistened dry dog food, hard boiled eggs, etc.) will encourage the birds to stay close to home.

Disease and Parasite Prevention:

Ren-o-sal in the water for keets and started-birds will aid in the prevention of coccidiosis. A routine worming program will keep your birds from internal parasite infestation. Safeguard, Panacur, Tramisol-Levasole (hog wormers), Ivomec, Piperzine (for round worms) are various kinds of wormers that are effective. A good basic worming schedule of three or four times a year is suggested. Lice, mites and fleas can all be controlled with

5% Sevin dust and Permectrin. Either direct application or treating the roosting area and pen will keep your guinea fowl free of external parasites. Antibiotics such as Aureomycin, terramycin, gallimycin, and tylan are useful in treating various respiratory conditions and also as a treatment for stress.

Breeding:

Incubation of Guinea fowl is twenty-six to twenty-eight days. Eggs are very hard-shelled, and we suggest that additional moisture should be added to the incubator prior to hatching. Keets are easily raised if not from inbred bloodlines. Provide them with a medicated chick starter and grit. Crushed hard-boiled egg, insects and shredded greens are additional sources of nutrients and protein. Keets can become very tame when daily offered additional treat foods on a daily basis.

Guinea fowls do not come into lay until about 1 year of age except some species such as: Ash and Pearl which reached to sexual maturity after 291.4 and 285.8 days respectively (Ayorinde, 1995). Sexing can be done by voice at an earlier age than by behavior. Cocks have a one-syllable call and hens a two-syllable call. At maturity, cocks will be observed running on tip-toes and displaying by raising wings. Hens walk more flat-footed. Helmet and wattles-size are not always reliable indicators of sex.

Crossing With Other Species:

The consequences of one or more large number of isolating mechanisms are that birds of different species or genera either do not mate or mate only rarely. Ecological and zoogeographical isolation has kept the Peafowl (Pavo cristatus) and Common Guinea fowl (Numida meleagris) apart in the wild as the guinea is native to the Ethopian Zoo geographical Realm and the peafowl to the Oriental Realm. However, under domestication these two species have been brought together by man. Both the Common Guinea and Peafowl belong to the order Galliformes, but are classified as members of different families. The peafowl belongs to the family Phasianidae while the guinea belongs also to family Phasianidae or to the family Numididae (Beaumount et al., 1993).

Only between domesticated chickens (Gallus gallus domesticus) and the Ring-necked Pheasant (Phasianus colchicus) have many natural hybrids been recorded. Through artificial insemination a number of hybrids have been produced. Chicken-quail hybrids (Coturnix coturnix japonica) were successfully produced before while several attempted crosses have been made between domesticated turkeys (Meleagris gallapavo) and chickens.

Description of a Peafowl-Guinea hybrid. This cross was hatched from a guinea egg under natural barnyard conditions. The specimen is three years old and from its general characteristics apparently is a female.

This peafowl-guinea hybrid has intermediate morphological characters. The head does not have the horny helmet of the guinea nor the crest of feathers of the peafowl. The gape waddles are vestigial and the face is partly bare of feathers with some blue characteristics of guinea fowl showing. Bill length is intermediate. Body shape is more nearly that of the peahen with peahen tail and wing characteristics. The coloring of the contour feathers is spangled pearl like the guinea with some of the brown characteristics of the peahen intermingled. The belly region is light like the peahen. Tarsus length, although intermediate is guinea-like in color and scales. Middle-toe length is also intermediate. Apparently this hybrid cross is a female but there has been no attempt of it to lay eggs even though it has gone through three breeding seasons.

Several crosses between peafowl and guinea fowl have been previously published as well as a large number of crosses among other members of the super family Phasianidae. Most of these published accounts however mention the hybrid with little description of the behavior and morphological characters. This paper describes the behavior and morphological characters of such a cross. Game breeders do not advocate inter-hybrid crosses, nevertheless these do occur under both natural and artificial conditions. The ease at which peafowl-guinea crosses occur seems to support a closer relationship of these two species than most taxonomists suggest. Possibly the Guinea fowl should also be placed in the same family as Mainardi, Yamashina and Sibley suggest.

Productive Traits:

Singh (1992) estimated the heritability (h^2) of body weight ranged from 0.28 at 8 weeks to 0.57 at 16 weeks, shank length from 0.24 at 16 weeks to 0.34 at 12 weeks and keel length from 0.03 at 16 weeks to 0.32 at 12 weeks.

The h^2 of age at first egg, total egg production, egg weight, egg shell thickness, albumen height and Hough unit index was 0.56, 0.43, 0.75, 0.44, 0.66, and 0.80 respectively. The genetic correlation of body weight at 4 weeks with body weight, shank length and keel length at 12 weeks were 0.78, 0.74 and 0.75 respectively. In addition, Beaumont et al. (1993) found that the h^2 under intensive conditions are 0.3-0.65 for body weight, 0.35-0.50 for egg weight and 0.20-0.35 for number of eggs.

Table (1): Comparison of morphological characters of the Guinea-Peafowl cross with male and female Peafowl and Guinea.

Characters	Peafowl ♂	Peafowl ♀	Guinea-Peafowl Cross ♀	Guineafowl
Culmen	5 cm	4.8 cm	3.5 cm	2.0 cm
Middle Toe Length	9.0 cm	7.5 cm	7.0 cm	6.5 cm
Tarsus length	10.0 cm	9.5 cm	9.0 cm	7.0 cm
Total wing length	57.15 cm	47.09cm	40.64 cm	28.94 cm

Brah et al. (1994) reported that body weight gains were maximum during the first 2 weeks followed by a sharp decrease until about 10-12 weeks of age.

Brijesh – Singh et al. (1998) stated that body weight was higher for males than females, maximum weight gain occurred between 8 and 12 weeks of age in both sexes, relative growth rate (RGR%) was maximum between 0 and 4 weeks of age and feed efficiency was best up to 12 weeks of age (2.76) but then increased. Return over feed cost was maximum at 12 weeks of age.

Song et al. (2000) compared among pheasant, chukar, quail and guinea fowl for characteristics of eggs, they found that egg weight was heaviest in guinea fowl (46.65g), followed by pheasant (25.79g), chukar (19.16g) and quail (10.34g). The proportion of yolk to the total egg weight was 30.6%, Albumen content was in the range of 55.6-57.4%, the ratio of yolk to Albumen (Y/A) was 0.55, the portion of shell to the total egg weight was 13.5% and the shell thickness of the egg was 462.8 μm in guinea fowl with no statistical difference among the 4 species.

Baeza et al. (2001) measured that the mean value of breast angle was 85 degrees, this value was significantly higher for the standard guinea fowl and for the females of Label and Standard genotypes compared with males. The skin was thicker for the Standard guinea fowls (0.84 vs 0.77 mm), carcass yield was higher for the males (68.7 vs 68.2 %) and the percentage of abdominal fat was higher for the Standard guinea fowls (2.8 vs 2.4%).

Light Program†:

Period (age in weeks)	Time of light
1	24 h
3 – 21	23 h
After 3 - 10 weeks	22.30 h
After 10 - 16 weeks	21.30 h
After 16 - 22 weeks	8 h
After 22 weeks	8.30 h
During production	16 h

† Personal communication (Szalay, 2004)

Reproductive Traits:

Harpreet et al. (1993) noticed that mortality was highest (9.7%) during the first 2 weeks of life, but remained quite high in the 3-4 week (6.8%) and 5-8 week (5.9%) age groups. Season of hatching influenced mortality with highest death rates of keets occurring during the monsoon season in all years.

Upreti et al. (1993) revealed that the ratio of males to females in the flock was 1:3 and eggs weighing 35-38, 39-42 and 43-45g , fertility was 76.09 ± 0.27, 75.94 ± 1.55 and 73.02 ± 1.16 % and hatchability of eggs set 75.63 ± 3.52, 79.53 ± 1.70 and 78.17 ± 3.82 % respectively. When eggs were stored for 7 days at room temperature, hatchability decreased with increasing storage time.

Ancel et al. (1994) concluded that the optimal temperature for setter and hatcher was 37.2 and 37.0 ^{C}. Relative humidity in setter and hatcher was 85 and 92 % respectively with water vapour partial pressure. By using these optimal conditions resulted in a total hatchability of 78-81% with values mentioned before. Ayorinde (1994) revealed that the weight loss of eggs during incubation was 5.42%. At hatching, keet weight was 72.42% of egg weight at hatching.

Nwagu and Alawa (1995) reported that a male: female ratio of 1 to 4 can give good fertility. The period of incubation was 28 days divided into 24 days in incubator and 4 days in hatcher. Temperature in the first 24 days was 37.7 c and relative humidity (RH) was 80% while in the end 4 days temperature was 37.5 c and RH was 95% and spray water in hatcher 4-5 times / day.

Nwagu (1997) observed that the fertility and hatchability of guinea fowl eggs can be affected by a wide rang of environmental influences as

well as genetic components. These include severe nutritional deficiencies, drugs, and pesticides and mycotoxins in the diet. Faulty handling and storage conditions and incorrect fumigation procedures have adverse effects on hatchability, while correct incubation temperature, humidity and ventilation rates during the setting and the hatching stage are essential for optimum results.

Brah et al. (1997) stated that guinea fowl eggs were stored in a cooling cabinet at 10^{C} for 1-15 days; the eggs were then held at room temperature for 24 h and placed in an incubator. An increase of 1-day in pre-incubation storage delayed hatching time by 2.43 h due to delayed pipping time.

Eggs from varieties of grey-breasted guinea fowl (Numida meleagris galeata, pearl, ash, black, exotic and exotic x pearl) were tested for fertility and hatchability. Egg fertility of crossbreds, pearl, exotic, ash and black was 61.58, 49.97, 40.94, 38.25 and 32.62 %, respectively, with hatchability 81.84, 64.07, 66.54, 57.43, and 57.34 %, these were lower than expected due to incorrect handling of fertile eggs (Nwagu et al., 1997).

Body Measurements:

Body weight is varied among strains and between the two sexes. Males are heavier than females in all Guinea fowl strains, relative growth rate was maximum between 0 and 4 weeks of age, and feed efficiency was best up to 12 weeks of age (2.76) then increased (Brijesh-Singh et al., 1998).

Body weight gain are detected to be high in the first 2 weeks of age, followed by a sharp decrease until about 10-12 weeks of age. Nigerian Guinea fowls have slow growth rate, weighting less than 1 kg at 8 weeks of age (Nwagu and Alwa, 1995).

In Nigeria, an experiment has been carried out concluded that the weight loss of eggs during incubation was 5.42%. At hatching, keet weight was 72.42% of egg weight at hatching. The regression of embryo weight in the first 4 and last 4 days of incubation on egg weight had corresponding correlations of 0.78 and 0.44, respectively. The regressions of keet body weights up to 4 weeks of age on egg weight were significant. Significant correlations of keet weight at hatching with subsequent body weights ranged from 0.76 for 1-week weight to 0.20 for 8-week weight (Nwagu et al., 1997).

There are significant differences among varieties in respect of body weight at one-day, 4 and 8 weeks of age, shank length at 12 weeks of age, and keel length at 8 weeks. At 12 weeks, pearl guinea fowls had the highest

body weight, lavender and white birds had the greatest shank length, and lavender birds had the greatest keel length.

Egg Production:

Ayorinde (1995) concluded that the means of age at sexual maturity were 285.8-291.4 days and weight at sexual maturity 1366.7g –1390.5g. Most of the eggs were laid in the first 6 months and egg in the first and second 3-month periods were strongly correlated with annual egg production. Egg production is confined to the rainy season –in Nigeria- from April to October. Most of the eggs are laid in the first 6 months and egg production in the first and second 3-months periods were strongly correlated with annual egg production (Nwagu, 1997). The laying season began in March and ended in September and 80-85% of hens began laying in April (Singh, 1992), who added that the egg laying season was longer in good than in poor layers and clutch size ranged from 1 to 17 eggs.

The heritability coefficient (h^2) is about 0.56 for age at 1st egg, 0.43 for total egg production, 0.75 for egg weight and 0.44 for egg shell thickness as well as the genetic correlation was 0.86 of total egg production with egg production during the first 90 days (Harpreet et al., 1993).

Carcass Traits:

Joseph et al. (1995) found that exotic chicken was the most consumed poultry meat in Nigeria, followed by local chicken, guinea fowl, duck and bush fowl in that order. Interestingly, in the laboratory sensory rating of the poultry meat types, guinea fowl had the greatest acceptability. This order of ranking could be attributed to the color and flavour palatability trait scores and the fact that most respondents prefer slightly tough meat to soft ones. Selection for 18-week body weight resulted in greatest changes in weight of breast muscle (78.0) and total edible meat (42.8%), these reported by Ayorinde (1996). Szalay (2002) stated that guinea fowl excellent meat quality.

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Useful Web Sites:

Guinea fowl
http://www.jefferspet.com
Hanebrink, E. L. Characteristics and Behavior of a Peafowl-Guinea Hybrid
Division of Biological Science, State University, Arkansas
http://www.guineas.com
D. N. Johnson Management of guinea fowl on farmland
www.kznwildlife.com/mngt_guineaf.htm
Smith, T. (1994). Ornamental Varieties of Guinea fowl
http://www.gbwf.org/hoagba
Guinea fowl & Turkey
http://www.gbwf.org/guineafowl/
Vulturine Guinea fowl
http://www.honoluluzoo.org/vulturine_guineafowl.htm