



Poultry Birds' Egg: An Egg inside Egg whose Biological, Nutritional and Cultural Value Gives and Sustains Life

Kingsley Omogiade IDAHOR*

Department of Animal Science, Nasarawa State University, Keffi, Shabu-Lafia
Campus, P.M.B, 135, Lafia,, Nigeria

***Corresponding Author:** Kingsley Omogiade IDAHOR, Department of Animal Science, Nasarawa State University, Keffi, Shabu-Lafia Campus, P.M.B, 135, Lafia,, Nigeria

Abstract: Since the domestication of poultry birds, a lot of information has been provided on production system, reproductive potentials, genetic improvement and feeding strategies. Unfortunately, little is known about the unique nature of the blastodisc in the yolk of poultry birds' egg. Consequently, information on poultry birds egg characteristics, formation, quality as well as the biological, nutritional and cultural values of poultry birds egg were provided. Ovulation of large mass of yolk containing the blastodisc from the left ovary only and the subsequent formation of shelled egg within the body cavity is peculiar to avian species. However, there are some similarities between the blastodisc in the poultry birds and the ovum in other animal species. The yolk has vitelline membrane that serves as barrier to the blastodisc that obtains nourishments from the yolk for growth and development. It is ovulated into the oviduct, where it is fertilized if mated exactly as found in other animal species. Therefore, blastodisc could be described as the actual egg cell and the only living portion of the poultry birds' egg which develops into embryo. If the shelled egg is fertilized and incubated, it becomes a hatchling and if consumed like the unfertilized egg it sustains life. Consequently, poultry birds' egg could best be defined as an egg inside egg that gives and sustains life”.

Keywords: Avian, blastodisc, cultural, egg, embryo, poultry, yolk.

1. INTRODUCTION

Domestication of avian species began long time ago, even before human civilization yet birds like quails, guinea fowls, pigeons, swans and doves are still being tamed. Meanwhile, some poultry birds like fowls, ducks, turkeys, geese, emu, peafowl and ostriches have been successfully domesticated. Among these breeds the fowl is the commonest and the most cherished by many people all over the world [1]. In most parts of the world, especially in rural communities, many people are involved in poultry production like manufacturing, sales and distribution of equipment, chicks, eggs, crates and feed for livelihood. The poultry industry could be divided into egg and meat production but the spent layer may also end up as meat even though it was bred, reared and maintained for egg production.

All over the world, the domesticated fowl species particularly the lighter weight strains are often kept for egg production because of their ability to lay 230 eggs or more per year [2]. Interestingly, whether sexually matured males are allowed to roam and mate with sexually matured females or not, the eggs will be formed and laid. However, fertilized eggs are only produced when males mate with the females or the females are inseminated artificially. While the unfertilized eggs end up in the diets of humans and “sustain their lives”, the fertilized eggs are incubated and “give life” to hatchlings. The poultry birds' egg contains a blastodisc also called blastoderm, germinal disc or ovum that originates with the yolk in the ovary but it is ovulated and swept into the infundibulum. Consequently, there is an egg inside an egg that becomes food for humans (table egg) or develops into a hatchling during incubation of a fertilized egg [3]. The poultry birds' egg contains all the nutrients and a large amount of water that the developing embryo will require during incubation and up to several days after hatching. The hatchlings when reared intensively or in a free range system will begin to lay eggs at about 18 to 26 weeks of age.

There are several reports on poultry production method, reproductive capabilities, genetic upgrading and feeding regimen [4, 5, 6, 1]. Unfortunately, little is known about poultry bird's egg

characteristics, biological, nutritional and cultural values. More significantly, there is dearth of information on the unique nature of blastodisc in poultry bird egg's yolk and its similarities with the blastodisc in other animal species often described as ovum or egg. Consequently, this review was articulated to provide information on poultry birds' egg biological, nutritional and cultural values as well as evidences of being an egg inside egg that "gives and sustains life".

Poultry birds egg formation

Unlike most female animal species, poultry female birds have one structurally developed and functional ovary as well as oviduct. This is because, during embryogenesis, the right oviduct degenerates, leaving only the left. The ovary is located in the body cavity near the back bone and consists of a mass of follicles at various stages of development. At hatch, a female hatchling's ovary has about 4,000 follicles, out of which only some are fully developed and ovulated in a life span of a mature poultry female bird. The large follicles are round, yellow and loosely connected or attached to the ovary by the follicular stalk and the yolk sac is richly supplied with blood and nutritional materials. The largest follicle containing the blastodisc ovulates when the yolk sac ruptures. Only one large follicle is ovulated at a time but two or more, may be ovulated resulting in double yolks egg or seldom double eggs with a shelled egg inside another shelled egg.

The oviduct, which is a complex organ with different segments, converts the nutrients from the feed consumed into the various components of a well formed egg. Figure 1 shows a typical reproductive tract of poultry female bird, the segments according to [7] are:

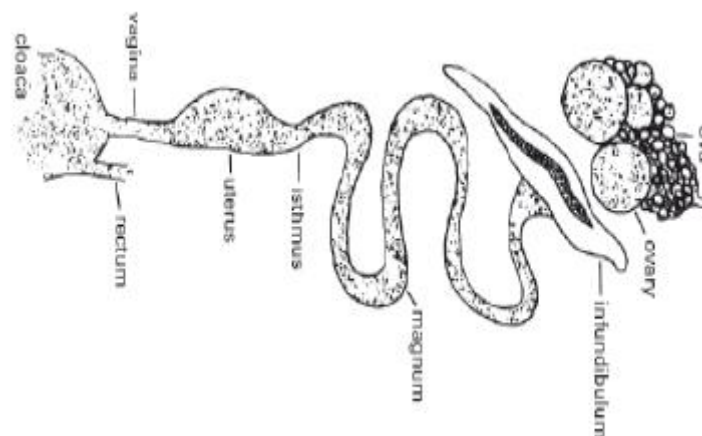


Figure 1. Typical female reproductive tract of poultry bird [7]

Infundibulum

At this region of the oviduct, chalaza is secreted on the yolk that stays for a ¼ hour and then migrates to the magnum.

Magnum

This is the longest portion of the oviduct where albumen is secreted around the yolk which spends 3 hours before migrating to the isthmus.

Isthmus

Here, shell membrane is secreted to enclose the yolk and albumen within 1¼ hour and then moves into the shell gland.

Shell gland

At this region, calciferous shell is secreted to enclose the formed egg and it takes 18 to 22 hours to complete the process. The egg shine called cuticle which prevents microbial activity on laid egg is also secreted at this region. Thereafter, the formed shelled egg moves to the vagina.

Vagina

Here, the formed shelled egg stays for a minute as mucous is secreted to ease lay.

Spermatozoa are capable of staying up to 3 weeks in the uterovaginal portion of the genital organ called "spermatozoa storage tubule". Thus, even after withdrawal of the males from the flock or cage or cessation of artificial insemination, the females can still lay fertilized eggs for up to 10 to 21 days [8, 9]. The egg hatching to either "give life" to a male or female hatchling, before now was regarded as a miracle of life. Recently, several scientists have reported hatchling sex reversal by manipulating incubation temperature, use of enzymes and molecular factors [10, 11, 12].

Poultry birds egg quality

According to [13] the poultry birds' egg quality relates to the various external and internal standards that are based on either subjective or quantitative measurements. It was reported that egg quality influences its acceptance or rejection by the consumers. The external quality parameters frequently measured are egg weight and shape as well as shell colour, thickness, weight and density. Other egg quality parameters are texture, surface area, cleanliness and Haugh unit value [14, 15]. External egg quality standard therefore measures uniformity in shell colour, egg size and shape and the shell should be smooth, clean and free from cracks. Poor egg shell quality has been of major economic concern to commercial egg producers and information from egg grading facilities indicated that 10% of eggs downgraded were due to egg shell quality defects [16, 17].

Egg internal qualities include the albumen and yolk viscosity, volume and colour, airspace size, yolk shape and strength as well as microbial load of the yolk and albumen. The factors that may cause loss of quality in poultry birds' eggs include blood spots or blood eggs, temperature, humidity as well as storage medium, time, taint and handling [18](Encyclopedia, 2012). If these factors are not properly controlled, the eggs may lose moisture and weight with enlarged airspace. More importantly, eggs can easily be tainted by strong odours from substances like kerosene, gasoline, diesel oil, paint and potatoes [18]. Thus, special care must be taken to avoid these during storage by selection of packaging materials and transport facilities to be used. It was stated [19] that qualities of eggs influence grading, pricing, consumer preference and hatchability. Consequently, in the United States of America, eggs are graded based on these qualities into "Grade AA" and "Grade A" for those that are meant for frying and poaching where appearance is important [20]. "Grade B" eggs have albumen that may be thinner with yolks that may be wider and flatter than those of "Grade AA" and "Grade A". They are meant for liquid, frozen, dried egg products and other egg containing products whereas, in Australia and the European Union, eggs are graded by the hen production system.

External characteristics of poultry birds' eggs

Weight/size

This varies according to the oviposition time hence [21] reported that eggs laid in the morning were heavier than those laid later in the day. According to [22] there was a strong correlation between early and late egg laid in a life span of a hen in terms of weight. Also, it was reported that body weight at sexual maturity has been reported to be highly correlated with the egg size. In most farms in Nigeria, the eggs laid at point of lay up to about 4 to 8 weeks are commonly called "peewee eggs" which are either sold at a giveaway price or given as goodwill because of the small size. Egg formation interval, age and body weight of the hen have been reported to influence egg size [23]. Feed availability and some essential amino acids like linoleic acid and methionine bioavailability have been associated with egg size and at point of lay, 18 to 20% crude protein ration may increase egg weight but at peak of lay, high protein ration may not increase egg size [24]. It was reported that after 36 weeks of age, 15 to 17% crude protein ration maybe beneficial. It was speculated [25] that egg weight could be used in predicting chick sex but [26] reported that this may not be feasible.

Shape

The elliptical shape of poultry eggs is believed to be due to the pressure exerted by the oviduct during egg formation and/or the wall of the cloaca during oviposition. According to [23] hens have strong muscles that push the egg during formation and in the process, give the shape as the shell is being formed but it was stated [27] that egg shape is determined by the oviduct, distribution of internal organs and shape of the pelvic bones. According to [25, 26] the shapes of poultry bird eggs ranged from elliptical, conical, round, oval to spherical. Egg length and width have been used to estimate the egg shape index which [28] reported could vary based on strain, egg size and time of lay. Also, it was stated that egg shape index increased until about 6 months of lay and then decreased gradually. It was

stated [29] that eggs laid during the second year of production had lower shape index than those laid in the first year. Effect of fowl egg weight, colour and shape on hatchling sex is given in Table 1. It was shown that egg external indices may not have any correlation with chick sex predetermination.

Table 1. *Effect of fowl egg weight, colour and shape on hatchling sex predetermination*

Parameters	Egg weight			Total
	50g	55g	60g	
Number of eggs incubated	30	90	30	150
Number of eggs hatched	20	43	24	87 (58.0)
Number of hatched male chicks	7	21	15	43 (28.7)
Number of hatched female chicks	13	22	9	44 (29.3)
Percentage hatchability (%)	66.7	47.7	80.0	
Male to female ratio of hatched chicks	7:13	21:22	5:3	
Weight of female chicks (g)	23.0	30.8	28.8	
Weight of male chicks (g)	30.5	39.7	42.1	
Mean weight of hatched chicks (g)	27.2	34.9	35.0	
	White	Silvery Brown	Spotted Black	
Number of eggs incubated	9	140	1	150
Number of eggs hatched	8	120	1	129 (86.0)
Number of hatched male chicks	5	52	0	57 (38.0)
Number of hatched female chicks	3	58	1	72 (48.0)
Percentage hatchability (%)	72.0	85.7	100	
Male to female ratio of hatched chicks	5:3	13:17	0:1	
Hatched chicks plumage colour	Silvery yellow	Silvery yellow	Silvery yellow	
	Conical	Oval		
Number of eggs incubated	88	62		150
Number of eggs hatched	61	54		115 (76.6)
Number of hatched male chicks	37	19		56 (37.3)
Number of hatched female chicks	14	45		59 (39.3)
Percentage hatchability (%)	69.3	87.1		
Male to female ratio of hatched chicks	37:14	19:45		

Shell

The structure and composition of the poultry bird egg shell serves as an embryo protective measure against damage and microbial contamination. It regulates gaseous and moisture exchange, as well as provides calcium for the growing embryo.

The egg shell contains calcium carbonate crystals, phosphorus, magnesium and traces of sodium, potassium, zinc, manganese, iron, copper and organic matter [30, 31, 32].

Shell colour

It was stated [23] that, as shell formation progresses, the epithelial cells lining on the surface of the shell gland begin to synthesize and accumulate pigments. All eggs are initially white, because of the calcite that make up bulk of the eggshell and the outer colour, is as a result of pigments known as porphyrins being deposited on the egg during formation within the oviduct. The type of pigment depends upon the breed and genetic makeup. According to [33] the brown pigment (protoporphyrin) is derived from haemoglobin in the blood and it is what gives the shell its light brown colour. In brown eggs, the three main pigments are biliverdin-IX, its zinc chelate and protoporphyrin-IX which [34] reported to be the most abundant. During the last 3 to 4 hours of final egg shell formation, the

bulk of the pigment is transferred to the protein rich viscous fluid cuticle that is deposited on the egg shell at about 1½ hour before lay. Age of the hen, health status, stress as well as the use of certain chemotherapeutic agents has been reported to affect the intensity of shell pigmentation [23, 33, 34]. Also, sudden changes in routine operations, environment, diets and shocks from noises, presence of predator and bullying within the flock were reported to result in pale egg shell. Dark brown eggs tend to have thicker shells [23, 34]. Interestingly, [35] reported that sun and high temperatures on hens faded the eggshell colour, but provision of cool water of 5⁰C was observed to normalize it.

At the meantime, no relationship between egg quality, fertility and shell colour has been established however, eggs with different shell colours, fertilized and unfertilized were reported not to differ in nutritional properties considering the egg quality parameters, organoleptic properties and cooking-time [36]. More so, it was stated that brown eggs come from hens on free range and white ones from caged hens [34]. According to [25] chick sex could be predetermined from shell colour but [26] observed no obvious relationship between egg colour and hatchling sex.

Cuticle

According to [37] avian egg cuticle is a thin layer which covers the entire egg shell, could be penetrated by gases and it functions as a defense to prevent the entry of bacteria into the egg through the egg pores. It was stated to be formed from sticky fluid which covers the egg when freshly laid and it dissolves due to carbon dioxide activity. Thus, when the cuticle disappears, the defensive mechanism is damaged and bacteria may penetrate the egg resulting in deterioration.

According to [39] avian egg cuticle contained 85 to 90% proteins thus if harvested, it could be utilized as supplement in human and livestock diets. Figure 2 shows the observation of [38] suggesting that avian egg cuticle could be harvested in commercial quantity.

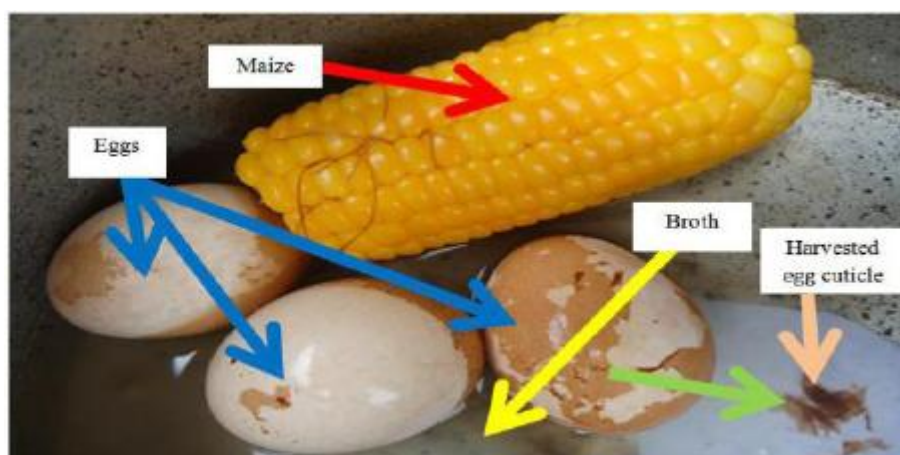


Figure 2. Possibility of harvesting avian egg cuticle [38]

Internal characteristics of poultry bird's egg

Anatomy of a typical poultry egg is shown in Figure 3. According to [18] the main components of fresh poultry birds' egg are yolk (32%), albumen (58%) and shell (10%). Others are chalaza, pores, airspace, vitelline membrane, cuticle and blastodisc.

Albumen

This is a clear liquid contained within an egg. It is commonly called egg white, albumen or glair/glaire. It forms around the yolk in the oviduct whether fertilized or unfertilized. It protects the yolk and provides additional nutrition for the growth of embryo. It is rich in proteins especially albumins, mucoproteins and globulins and it contains little or no fat [18].

Yolk

This is the yellow or gray spherical part of an egg that is surrounded by the albumen. Essentially, the yolk colour is dependent on the diet of the hen. If the diet contains yellow or orange plant pigments called xanthophyll (e.g. marigold petals and yellow maize), it will be deposited on the yolk thereby colours it. Meanwhile, lutein is the most abundant pigment in egg yolk [41, 20]. The egg yolk is

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suspended in the albumen by single or double spiral bands of tissue known as chalaza or chalazae, a Greek word meaning hailstone or hard lump [18].

In a newly laid egg, the yolk is round and firm but as it ages, it absorbs water from the albumen thus increases in size and weakens the vitelline membrane. The vitelline membrane is the clear casing enclosing the yolk that feeds the developing embryo. The poultry bird's egg is of high nutritional value because of the egg albumen and yolk that are meant to sustain the embryo [18] hence it could be said that poultry birds' egg "gives life". Also, these egg components supply all the essential amino acids required by humans. They provide several vitamins like retinol, riboflavin, folic acid, pyridoxine, cobalamin as well as minerals like chlorine, iron, calcium and phosphorus [42] required for healthy human life therefore poultry birds egg "sustains life".

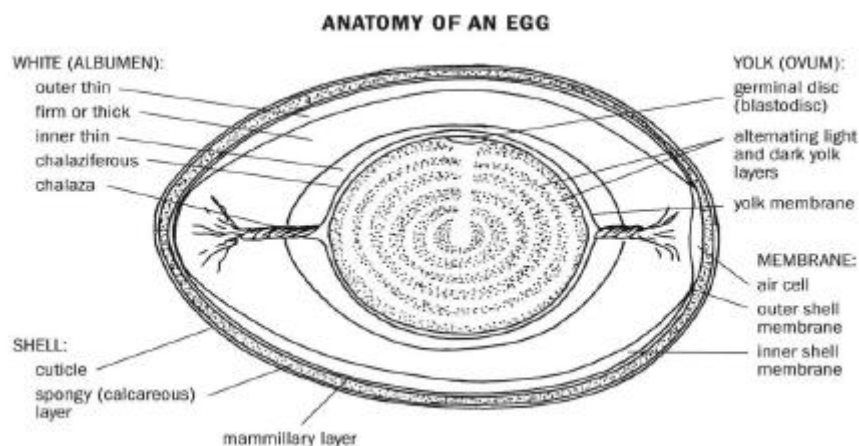


Figure 3. Anatomy of a typical poultry egg [40]

Blastodisc

This is also known as the germinal disc which is the actual egg cell that is made up of a plate of cells where the embryo develops from. It is the only living portion of the egg. The yolk and blastodisc are the only parts of poultry birds' egg that are produced in the ovary and are not contributed to by the oviduct. The blastodisc and the nutrients that will nourish the developing embryo are contained within the membrane and the egg shell which protects the contents of the egg from external adversities [3].

Airspace

The shape of an egg resembles a spheroid with one end larger than the other and symmetrically cylindrical along the long axis [18]. The airspace also known as air cell is formed between the inner and outer membranes at the larger end of the egg. It is believed to be formed when the contents of the egg cool down and contract after it is laid. The mechanism involves air being drawn through the cuticle and pores in the shell as moisture or water is being lost. During storage, the egg becomes less dense and the larger end of the egg will rise to increasingly shallower depth and when the egg is placed in a bowl of water it floats. Such eggs were said to have deteriorated and should not be consumed by man. It was stated that the deterioration may have set in due to the age of the egg [43].

Pores

These are openings on the egg shell, which allow exchange of moisture and gasses between the egg content and the environment. Most of these pores are found at the broad end of the egg with a few at the tapered end [44].

Evidences that poultry birds' egg has an egg inside it

- ✚ The yolk contains blastodisc that is equivalent to the egg cell of other animal species.
- ✚ The yolk containing the blastodisc has vitelline membrane like ovum or egg of other animal species.
- ✚ The vitelline membrane forms a covering over the yolk as found in other animal species with elastic tendency thus, serve as barrier to the blastodisc.

- ✚ The blastodisc is found in the yolk where it derives its nourishments for growth and development thus, the blastodisc is equivalent to egg cell found in other animal species.
- ✚ The blastodisc is also ovulated with the yolk which is swept into the oviduct for fertilization if mated or inseminated just like in other animal species.
- ✚ The ovulated blastodisc wait for a while at a particular region of the oviduct, before migrating into the uterine body, similar to reproductive process of other animal species.
- ✚ Fertilization requires the union of male and female gametes in most animal species thus, only when the female poultry birds are mated by males or inseminated that fertilized eggs are laid.
- ✚ Only fertile or fertilized egg develops blood capillaries and opaque mass (when candled during incubation) similar to the embryo or foetus of other animal species.
- ✚ Deterioration of poultry birds' egg (which can be equated to menorrhagia or mummification in other animal species), only sets in when the blastodisc or the developing embryo is denatured, suppressed or killed by adversities.

Consequently, the blastodisc could be described as the actual egg cell that is equivalent to an ovum or egg of most other animal species. Since blastodisc is embedded in the yolk which is enclosed in the fully formed and laid egg (fertilized or unfertilized), poultry birds' egg may be described as an "egg inside shelled egg".

Evidences that poultry birds egg "gives and sustains life"

Biological values

As adapted by [45] in [46] the biological value of poultry birds' egg (Table 2) was rated to be 100%, apparently higher than that of milk (91%) which sustains young mammals so, poultry birds' egg could equally sustain man.

Table 2. *Biological value of poultry egg*

Biological value (%)	Reference
100.0	[45]
100.0	[47]
94.0	[48]
93.7	[49]
93.7	[50]

Poultry birds' egg is used in medical and pharmaceutical industries to manufacture drugs, vaccines, biological science experimentations especially those involving viruses. Proper incubation of fertilized poultry birds' eggs often results in high quality hatchlings. When properly brooded, they become adults that will in turn reproduce for life continuity hence poultry birds' egg "gives and sustains life".

Nutritional values

Nutritional profiles of poultry egg are provided in Table 3. It was shown that hard-boiled, fresh, fertilized and unfertilized poultry bird's egg values appeared similar but fresh egg tended to be superior. Meanwhile, fresh egg has been reported to contain antinutritional factors (e.g. avidin) that bind some vitamins e.g. biotin [51]. It was stated [52] that every part of poultry birds' egg was edible and it was a good source of high quality protein, iron, vitamins and phosphorus. Although, egg was said to be low in calcium, ground egg shells was reported to be used as human food additive to provide calcium.

Table 3. *Nutritional profiles of poultry egg (per 100g)*

Nutrients	Hard-boiled egg	Raw fresh egg	Cooked fertilized egg	Cooked unfertilized egg
Energy	647.00 kj (155Kcal)	1, 325 kj (317 kcal)	1, 782 kj	1, 790 kj
Carbohydrate	1.120 g	3.59 g	19.33%	20.82%
Fat	10.60 g	26.54 g	12.68%	12.46%
Protein	12.60 g	15.86 g	16.38%	15.83%
Tryptophan	0.153 g	0.177 g	ND	ND
Threonine	0.604 g	0.687 g	ND	ND

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Isoleucine	0.686 g	0.866 g	ND	ND
Leucine	1.075 g	1.399 g	ND	ND
Lysine	0.904 g	1.217 g	ND	ND
Methionine	0.392 g	0.378 g	ND	ND
Cysteine	0.292 g	0.264 g	ND	ND
Phenylalanine	0.668 g	0.681 g	ND	ND
Tyrosine	0.513 g	0.678 g	ND	ND
Valine	0.767 g	0.949 g	ND	ND
Arginine	0.755 g	1.099 g	ND	ND
Histidine	0.298 g	0.416 g	ND	ND
Alanine	0.755 g	0.836 g	ND	ND
Aspartic acid	1.264 g	1.550 g	ND	ND
Glutamic acid	1.644 g	0.595 g	ND	ND
Glycine	0.423 g	0.488 g	ND	ND
Proline	0.501 g	0.545 g	ND	ND
Serine	0.936 g	1.326 g	ND	ND
Vitamins:				
Vitamin A	19% (149 µg)	(48%) 381 µg	ND	ND
Thiamin (B1)	6% (0.066 mg)	(15%) 0.176 mg	ND	ND
Riboflavin (B2)	42% (0.500 mg)	(44%) 0.528 mg	ND	ND
Niacin (B3)	0% (0.064 mg)	ND	ND	ND
Pantothenic acid (B5)	28% (1.400 mg)	(60%) 2.990 mg	ND	ND
Vitamin B6	9% (0.121 mg)	ND	ND	ND
Folate (B9)	11% (44 µg)	(37%) 146 µg	ND	ND
Vitamin B12	46% (1.11 µg)	ND	ND	ND
Choline	60% (294 mg)	(167%) 820.2 mg	ND	ND
Vitamin D	15% (871 µg)	(36%) 218 IU	ND	ND
Vitamin E	7% (1.03 mg)	ND	ND	ND
Vitamin K	0% (0.3 µg)	ND	ND	ND
Minerals:				
Calcium	5% (50 mg)	(13%) 129 mg	124.00 mg	127.00 mg
Iron	9% (1.2 mg)	(21%) 2.73 mg	2.91 mg	2.65 mg
Magnesium	3% (10 mg)	(1%) 5 mg	11.97 mg	11.94 mg
Phosphorus	25% (172 mg)	(56%) 390 mg	224.80 mg	211.36 mg
Potassium	3% (126 mg)	(2%) 109 mg	155.50 mg	153.35 mg
Sodium	8% (124 mg)	ND	92.60 mg	88.45 mg
Zinc	11% (1.0 mg)	(24%) 2.30 mg	5.20 mg	5.65 mg
Copper	ND	ND	0.83 mg	0.86 mg
Selenium	ND	ND	0.06 mg	0.06 mg
Manganese	ND	ND	0.27 mg	0.28 mg
Others				
Water	75g	52.31 g	56.88 %	56.59 %
Cholesterol	373mg	1, 085 mg	795.30 mg	791.50 mg
References	[54]	[55]	[36]	[36]

ND: Not determined

Meanwhile, the commonest food allergy in infants is egg, but they could grow out of it during their childhood if exposure is minimal [53].

It was reported that allergic reactions against egg albumen was commoner than reactions against egg yolk. Besides humans, some other animal species like reptiles (particularly snakes), cats and rodents also feed on poultry birds' egg.

Cultural values

There are myriad of beliefs about the poultry birds' egg especially among the Africans. Typically, The Great People of Bini Kingdom (Èdo nẹ igodomigodo) in Nigeria hold the belief that poultry birds' egg rubbed with palm oil and touched one's head then smashed on the highway helps one to avert

accident. Also, they use poultry birds' egg (cooked or raw depending on the situation) in rituals called "izobo" usually placed on the road side, junction or ring road to save human life. When poultry birds' egg is cooked, it has white and yellow distinct attractive colours. This phenomenon has enhanced the consumption of corn-based diets among The Great Binis. These are fermented corn product called "akasan" (similar to egg white) and unfermented corn product called "uloka" (similar to egg yolk). The combination of these corn-based products as a meal, exactly looks and taste like cooked egg and it is highly relished by The Great Binis.

Unfortunately, children among this tribe are not allowed to eat eggs. Where it is sometimes permitted among the elites, cooked egg is quartered for four children per meal. This is probably due to conviction of the elites that poultry birds egg are so nutritionally rich that, even a quantum can supply the nutritional need of a child.

In some villages in The Great Bini Kingdom, poultry birds' raw egg is used to play a game to test the strength of a youngster. The game is played by placing the egg with the wider and pointed ends in between the palm hands and press hard in order to break it. Up to this moment, no one has been able to break an egg in this kind of game.

2. CONCLUSIONS

It has been established that whether a poultry female bird is mated, artificially inseminated or not, at sexual maturity, eggs must be formed in the oviduct and laid as either fertilized for reproductive cycle to ensure species continuity or unfertilized for human utilization. The unfertilized eggs are basically consumed in different ways and in various forms by humans for life sustenance. Whereas, the fertilized eggs are incubated to "give life" to the hatchlings which grow and become sexually mature and in turns reproduce young ones. The biological value of poultry birds' egg is believed to be so high, that it can sustain man for some days if solely consumed even without other foods and water.

More importantly, poultry birds' egg contents can sustain the metabolic pathways in the metamorphosis of the blastodisc (which is equivalent to the ovum in other animal species) into embryo during incubation and eventually into the hatchling. There are similarities between the blastodisc in poultry bird egg and the ovum in other animal species. So, poultry birds' egg could be described as an egg inside egg whose biological, nutritional and cultural values "gives and sustains life".

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