

Nutritional Status and Cognitive Value of Egg White, Egg Yolk Whole Egg based Complementary Food

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Abstract

Prominent among animal proteins, Eggs are one of the only foods that naturally contain vitamin D and Choline, that are essential for normal physiology, psychology reasoning and functioning of all children cells, but particularly important during pregnancy to support healthy brain development of the foetus and it is likening to a Mothers 'breast milk. The purpose of the study was to investigate the nutritional status and Cognitive Value of Egg White, Egg Yolk and the Whole Egg based complementary Foods. The Composition of the weaning foods are as follow: Egg White10% basal 90 % (1), Egg Yolk 10 % Basal 90 % (2), Whole Egg10 % Basal 90 % (3), Control 100% Milk- based commercial diet (4), Basal 100% (5). The parameter examined were Growth response, Weight of Internal Organs (Endocrine), Nitrogen Retention and Biological Value of the experimental animals the results revealed that. Weight of Internal Organs (Endocrine), group of animal fed on diets 1-4 grew and increase in size expect for basal diet which could not could not promote increase in sizes of the organs. The highest retention of nitrogen was found in animal fed with Egg White10% basal 90 % (1), Egg Yolk 10 % Basal 90 % (2),and the Whole Egg10 % Basal 90 % (3), and compared favourably with Control diet Milk- based commercial diet (4), basal diet could not support growth because it is limiting in essential amino acid, Basal 100% (5)

In Conclusion experimental animals fed on Egg based complementary food 1-4, increased in growth with 53.11g, 63.31g, 46.26g, 40.92g, and 5 retards the Control growth by -4.05 for 28 days. The biological value (BV) of diets 1-3 was compared favourably with Control Milk- based commercial diet (4). Egg White, Egg Yolk and the Whole Eggs based complementary food were viable to promote growth and could give a cognitive reasoning to an Infant and children.

Keywords: Cognitive Value; Egg White; Egg Yolk; Whole Egg

Introduction

Breastfeeding of baby by nursing mother at first few months of infants is indeed very critical., Infant, and children at six months old and below were vulnerable, because breast milk and formula may no longer be sufficient to meet their increasing daily nutritional needs [1,2].

The aim of the study is to determine the Nutritional status and cognitive value of Egg White, Egg Yolk and the Whole Eggs based complementary foods. How eggs impact diet quality and measure the growth response on health of children. Egg consumption has been attributed to healthy growth and development of infant, baby and children also compared favourable to a Mothers' breast milk. The egg white has been linked to an excellent natural source of high quality protein, which is rich in essential amino acids. The yolk is a source of antioxidants, aromatic amino acids, carotenoids, vitamins, phospholipids and proteins, which not only provide nutritional value but also act pro-health and might prevent egg from heart diseases. In turn eggshell supplies well absorbed by the Egg allergy affects almost 2% of children and along with milk and peanut, makes up 80% of childhood accounts for food allergic reactions. Egg allergy typically presents in the child's first year of life and ~50% of children do not "outgrow" (or become tolerant to) their egg allergy, but if they do, it may not happen until as late as their teenage years. In particular, the nutrients needed for cognitive development including iron, zinc, choline and docosahexaenoic acid (DHA) must start to come from semi-solid foods and a reported loaded in an egg. We also now know that early exposure to common allergens including eggs and peanuts can actually help decrease the development of problematic food allergies. In order to promote iron absorption, parents should also know that iron-rich foods should be offered with a source of vitamin C, which can be as simple as meatballs served in tomato sauce or cooked egg yolks offered alongside kiwi slices. Eggs are an all-natural source of high-quality protein and a number of other nutrients, all for 70 calories per large egg. Cost-effective and versatile, the unique nutritional composition of eggs can help meet a variety of nutrient needs of children through older adult [1,2].

Prominent among the animal protein source is Egg and is one of the only foods that naturally contain vitamin D and choline, are essential for normal functioning of all children physiology. In particularly, Eggs protein is important during pregnancy to support healthy brain development of the foetus. Lutein and zeaxanthin, antioxidants that are believed to reduce the risk of developing cataracts and slow the progression of age-related macular degeneration, a disease that develops with age [3].

Eggs have dual function which include playing a role in weight management, muscle strength, healthy pregnancy, brain function, eye health and more [1,3].

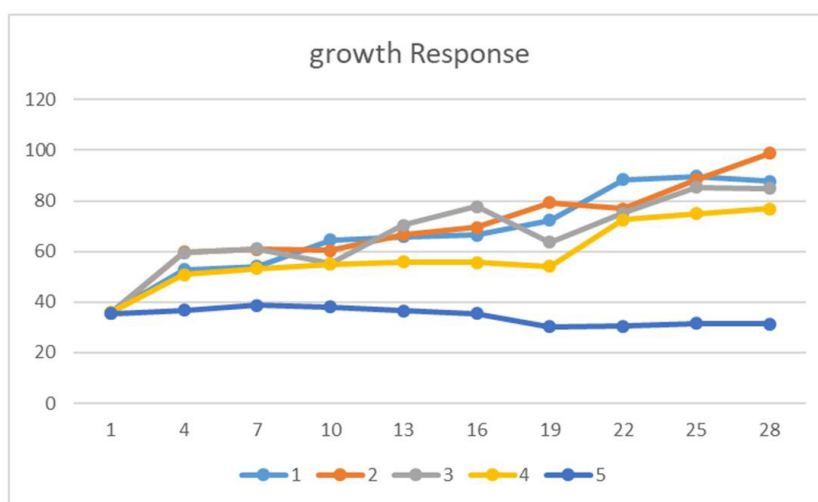
Two important nutrients as including choline and lutein are reportedly responsible for brain health and cognition are found in eggs. Choline plays a role in early brain development during pregnancy and infancy, particularly in areas of the brain that are used for memory and learning. Lutein has long been associated with eye health but researchers' have discovered lutein's role in cognition as well healthy strong muscles are important throughout the lifespan. Resistance training and sufficient dietary protein help support muscle maintenance and strength. Studies have shown the importance of both the total amount of protein consumed each day as well as the amount of protein per meal. However, emerging research is showing other factors within food, besides protein, influence the synthesis of new proteins in [4-6].

Scientists have also examined how amino acids and isolated sources of protein impact muscle protein synthesis. It is also reported that egg contain all nine essential amino acids in the amounts in the body needs to function at its best. This research serves as a foundation to better examine aspects beyond protein. Leucine, an essential amino acid, turns on the machinery driving the synthesis of new proteins in muscle. While leucine is the switch turning this process on, all essential amino acids are necessary to provide the building blocks for muscle protein synthesis to be running optimally. Quality sources of protein including whey, egg, soy and beef contain all essential amino acids in appreciable quantities to support this process. Studies have compared protein-rich drinks and whole foods have led to results that cannot be explained by differences in leucine or the amount of high quality protein consumed [7,8].

Materials and Methods

The method of Ibronke *et al.*, (2020)18-19 was adopted. Fifty Wister albino rats of both sexes were obtained from the Faculty of Pharmacy breeding center, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria. The weights and ages of white albino rats were ranged from 35.60-45.86g and were ranged between 3-6 weeks old, respectively. The experimental animals were randomly weighed selected and distributed into five groups of ten animals per group and was housed in a metabolic cage. They were fed on animal feeds finisher for seven days to acclimatize them to the new environment and make them stable and familiar to the environment. The experimental animals were placed on the experimental diets 1-5 for a period of 4weeks). Water and food was administered *ad libitum* to the experimental animals daily. During the period of 28 days of the experiment, feed intake was recorded and the weights of the experimental animals were taken every three days. Seven days towards the end of the experiment, the faeces and urine of the experimental animals in the different groups were collected separately. Urine was stored inside a bottle per group containing 6N HCl in order to preserve it, prior analysis, and the faeces were dried in an oven at 60 °C for 12 hours, cooled, weighed and stored inside sealed polythene, per group. At the end of the 28 days, the animals were weighed, anaesthetized and sacrificed. Tissue samples from liver, kidney` and plantaris muscles were removed, Nitrogen in the faeces and urine were determined by the micro Kjeldahl method [9-16]. The organs collected from the animal including heart, lungs, kidney and liver were fixed immediately in 10% formyl saline for further experiment such as Nitrogen retention [2,11].

Statistical Analysis



Egg White 10% basal 90 % (1), Egg Yolk 10 % Basal 90 % (2), and the Whole Egg 10 % Basal 90 % (3), and compared favourably with Control diet 100% (4), that it is reported to contain all nine essential amino acids in the amounts in the body needs to function at its best but essential amino acid is limiting in basal diet 100% (5)

Figure 1: Growth Response for 28 days



Egg White10% basal 90 % (1), Egg Yolk 10 % Basal 90 % (2), and the Whole Egg10 % Basal 90 % (3), and compared favourably with Control diet 100% (4), because it is reported to contain all nine essential amino acid but amino acid is limiting in basal diet, Basal 100% (5)

Figure 2: Weight gain/loss in experimental animals

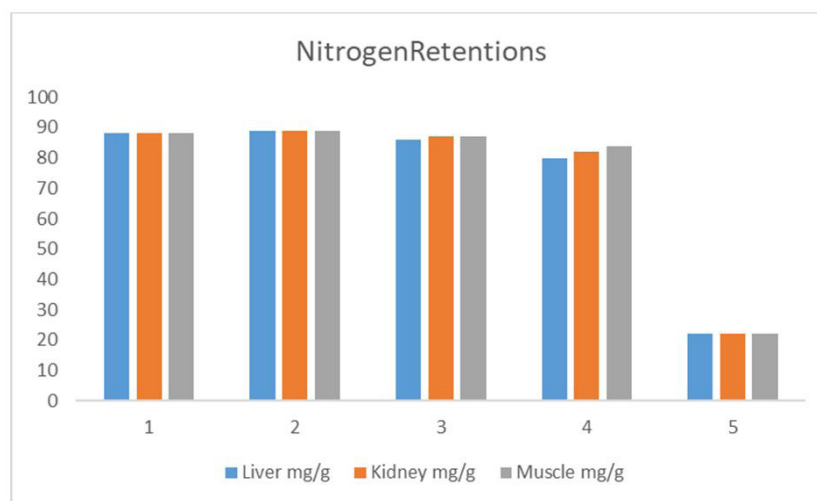
Statistical analysis of the data was carried out using the one-way Analysis of Variance (ANOVA) technique (SPSS 17 for windows) and the differences were separated using Duncan’s Multiple Range Test (DMRT) at a level considered to be significant at $p < 0.05$.

Egg White10% basal 90 % [1] promote optimum growth but not up to Egg Yolk which produce the highest growth and compared favourably with commercial weaning food [3], and followed by Whole Egg10, but Basal limiting experimental Animals growth 5. This is because it is deficient in essential amino acid. However, egg yolk contains fat that could led to cholesterol build up which is not present is present Egg whites, on the other hand, are reported to be pure protein and contain no fat or cholesterol. Although someone taken egg yolk for very long time may result in obesity and other ailments because it contains high calories [9,16]. Also supported by Grzegorz Lesnierowski (2017). The yolk contains valuable phospholipids, immunoglobulins that could trigger cholesterol in animal if taken in excess [5] (Figures 1 and 2).

	Liver g	Kidney g
1	5.76±0.03	0.99±0.01
2	5.90±0.02	0.79±0.02
3	5.88±0.01	0.78±0.03
4	4.33±0.02	1.68±0.00
5	3.67±0.02	0.50±0.00

Mean ±SD values of three determinations with different superscript in a row are significantly Egg White10% basal 90 % (1), Egg Yolk 10 % Basal 90 % (2), Whole Egg10 % Basal 90 % (3), Control 100% (4), Basal 100% (5)

Table 1: Weight of Internal Organs (Endocrine)



Egg White10% basal 90 % (1), Egg Yolk 10 % Basal 90 % (2), and the Whole Egg10 % Basal 90 % (3), and compared favourably with Control diet 100% (4), but limiting in basal diet, Basal 100% (5)

Figure 3: Nitrogen Retention

Table 1: Weight of Internal Organs (Endocrine) states. The endocrine system which include the liver and Kidney. The Liver was ranged between 3.67 -5.90g, and the Kidney was ranged between 0.50.-1. 68g respectively. However, all of the cholesterol and fat in eggs is found in the egg yolk [5]. Egg whites are reportedly, contained pure protein and contain no fat or cholesterol and could not add to the weight the liver and kidney for Diets 1-4 support growth of experimental animals progressive that it is previously reported to contain all nine essential amino acids in the amounts in the body needs to function at its best while. Protein is also important for maintaining and building muscle — especially for baby and children with kwashiorkor that has lose weight. Diet 5 could not sustain growth because it is limiting in essential amino acid [2,11-16]. This is according to Ibironke *et al.*, [12-17] (Table 1) (Figure 3).

Nitrogen Retention Shows Liver mg/g Kidney mg/g and Muscle mg/g .The highest retention of nitrogen was found in animal fed with Egg White10% basal 90 % (1), Egg Yolk 10 % Basal 90 % (2), and the Whole Egg10 % Basal 90 % (3), and compared favourably with Control diet 100% (4), but limiting in basal diet, Basal 100% (5) because it lack essential amino acid. All Eggs reported to contains all nine essential amino acids in the amounts in the body needs to function at its best. Egg Whites Nutrition is high in protein, low in carbohydrate; Eggs are loaded with a variety of beneficial nutrients. However, the nutritional value of an egg can be varied greatly, and it depending on part one eat the whole egg, yolk and the egg whites. Corroborate with the findings of Grzegorz, 2018 [6] that the egg white is an excellent natural source of high quality protein, which is rich in essential amino acids.

Due to their high protein content found in egg whites it have some health benefits over yolk egg. Egg Whites Protein can help curb one appetite, so eating egg whites could make one satisfy hunger for longer time. Egg Whites Protein is also important for maintaining and building muscle — especially for baby and children with kwashiorkor that has lose weight while Corroborate with the findings of Grzegorz,2018 [6] that The egg white is an excellent natural source of high quality protein, which is rich in essential amino acids.

Whole eggs will provide one with only slightly more protein for quite a few extra calories, egg whites can be an appealing choice for people who are trying to lose weight [2,11-15,18,19]. Corroborate with the findings of Grzegorz, 2018 [6] that The egg white is an excellent natural source of high quality protein, which is rich in essential amino acids. The yolk is a source of antioxidants, aromatic amino acids, carotenoids, vitamins, phospholipids and proteins, which not only provide nutritional value (Table 2).

Complementary food	BV %	NPR	PER
1	75±00.02	4.8±0.03	5.2±00.0
2	76±0.01	5.9±0.02	6.3±0.01
3	74±0.02	4.5±.0.01	4.9±0.02
4	72±0.02	3.7±0.02	4.1±0.01
5	-	-	-

Mean ±SD values of three determinations with different superscript in a row are significantly Egg White10% basal 90 % (1), Egg Yolk 10 % Basal 90 % (2), Whole Egg10 % Basal 90 % (3), Control 100% (4), Basal 100% (5)

Table 2: Biological Value

Table 2: Biological Value. (BV %) presents the NPR and PER of diet 1-3 was ranged between 72-76 3.7-4.8 and 4.1-6.3 respectively. It was comparable favourably with control Egg Whites Nutrition is high in protein, low in carbohydrate; Eggs are loaded with a variety of beneficial nutrients. Egg contains all nine essential amino acids in the amounts in the body needs to function at its best. However, the nutritional value of an egg can be varied greatly, and it depending on whether one eat the whole egg, yolk and the egg whites. Due to their high protein content found in egg whites it have some health benefits over yolk egg. Protein can help to curb one appetite, so eating egg whites could make one satisfy hunger for longer time. Protein is also important for maintaining and building muscle — especially for baby and children with kwashiorkor that has lose weight. Whole eggs contain both egg white and yolk will provide one with only slightly more protein for quite a few extra calories, egg whites can be an appealing choice for people who are trying to lose weight [2,11-17,20-23].

Conclusion

Egg White, Egg Yolk and the Whole Eggs based complementary food were viable to promote growth and could give a cognitive reasoning to Infant and children and compared favourably to mother breast milk. Experimental animal fed with complementary food 1-4, increased growth with 53.11g, 63.31g, 446.26g, 40.92g while diet 5 retard growth of Experimental animal by-4.05. Egg Yolk promoted the best growth with 63.31, followed by Egg White and the least by the Whole Egg. Egg depends on whether one eats the whole egg, yolk and the egg whites. The Whole eggs will only provide slightly more protein for quite a few extra but egg yolk will provide both protein and calories, egg whites can be helpful for people who are trying to lose weight and to combat kwashiorkor in baby and children to curb who has lose weight.

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