Egg

Egg is an ovulated reproductive cell which is naturally completed in the female genital organ of birds and obtained after laying. It is the largest cell of the nature and widely used as delicious nutritive food of human.

Egg Structure

A. Egg Shell
B. Egg membrane
    a) Outer shell membrane
    b) Inner shell membrane
C. Air sac: In between outer and inner shell membrane.
D. Egg white or Albumen
    a) Dense albumen
    b) Inner loose albumen
    c) Chalaza
E. Yolk
    a) Vitelline membrane
    b) Germ spot or Germinal disc.

Food Value of Egg

Egg is the most nearly a balance food of all the foods available to man. It contains all essential nutrients that we need for growth, maintenance, lactation and reproduction. The edible portion of the egg is made up of the yolk and the albumen. A hen's egg weighing 57g gives us about 51g of food materials made up of by 18g yolk and 33g albumen. The nutrients include proteins, fats, vitamins and minerals.

Protein: The yolk and albumen contain about 17.5 % and 11.0 % protein respectively. An egg of 57g contains 6.7g protein (3.64g in albumen and 3.15g in yolk). It is highly digestible quality protein. The biological value of egg protein is 95% as compared to 85% for milk and 70% for meat protein. It is a complete protein, because it contains all essential amino acids required to maintain body, promote growth and reproduction.

Chemical composition of an egg of 57g

	Whole Egg	Albumen	Yolk	Shell	Energy calories
Water	37.50	29.04	8.64	-	
Protein	6.70	3.64	3.15	-	
Fat	6.20	0.06	5.85	-	
Ash	6.60	0.26	0.36	5.76	
Total	**57g**	**33g**	**18g**	**6g**	**90**

Fats: Egg yolk contains 32.5% fat & only 0.2% in albumen. An egg of 57g contains 6.2g fat. Egg fat is very well-emulsified unsaturated fats which are easily digestible.

Carbohydrate: As egg is an animal product so its carbohydrate content is below 1%.

Energy: Egg is moderate from the standpoint of calorie content. An egg of 57g supplies 90 calories energy to our body.

Vitamins: Egg contains all fat soluble vitamin- ADEK and all members of B-complex including vitamin-B_{12} which are stored in the yolk. Egg yolk is a potential source of vitamin-A varies from 200 to 1000 I.U. Its component is present in pure forma as well as in precursor i,e., as carotenoid pigments. The quantity of vitamin-D depends on direct sunshine to the layers and vitamin-D supplement in the poultry ration. An egg supplies 15% vitamin-D of the daily needs of an adult person.

Minerals: The egg contains a large number of mineral elements. It contains 116 mgm phosphorous of which 110 mgm present in yolk, iron-2 mgm mostly in the yolk, calcium in the edible portion is about 2gm per egg. Others are Na, K, Mg, S, Cl, Zn, Cu, Mn, etc. are also present.

A man recommended 3000 calories energy, 70g protein, 50g fat and 570g carbohydrate per day. A man gets 90 calories energy, 6.7g protein and 6.2g fat from an egg.

Comparison and Composition of Chicken and Duck Egg (100g edible)

	Energy (calories)	Water %	Protein %	Fat %	Carbohydrate %	Ash %
Chicken	163	73.7	12.5	11.5	0.9	1.0
Duck	191	70.4	13.0	14.5	0.7	1.1

Nutritive Value of Egg

Components	Recommended daily allowance for a man	Quantity in 1 egg	Quantity in half pint (Approx. 280 ml)
Energy(calories)	3,000	90	205
Protein(g)	70	6.6	9.9
Fat(g)	50	5.5	10.3
Carbohydrate(g)	570	--	14.0
Calcium(g)	0.8	0.03	0.37
Phosphorus(g)	0.9	0.12	0.28
Iron(mg)	12.0	1.6	0.10
Vitamin A (i.U.)	5,000	600	600
Vitamin D(i.U.)	400	50	--
Vitamin B_1(mg) (Thiamine)	1.5	0.09	0.10

Vitamin C(mg)	75	-	6.0
Vitamin B_2(mg) (Riboflavin)	2.0	0.19	0.25
Niacine (mg)	18	0.04	0.08

Composition of Protein Showing Approximate Amino Acid Content in % of Protein (N x 6.25)

Amino acid %	Rice	Cow milk	Hen egg	Chicken meat
Arginine	7.2	4.2	6.6	7.1
Histidine	1.7	2.6	2.4	2.3
Lysine	3.2	8.7	7.0	8.4
Tyrosine	5.7	6.0	4.5	4.3
Tryptophan	1.3	1.5	1.5	1.2
Phenylalanine	5.0	5.5	6.3	4.6
Cystine	1.3	1.0	2.4	1.3
Methionine	2.3	3.2	4.0	3.2
Threonine	3.8	4.7	4.3	4.7
Serine	-	4.3	-	4.7
Leucine	8.2	11.0	9.2	-
Isoleucine	5.2	7.5	7.7	-
Valine	6.2	7.0	7.2	-

Egg production of poultry

Species	Age of Sexual Maturity (Month)	Eggs/year (Nos)	Egg Weight (gm)
Chicken	5-6		57
Egg type		250	
Dual type		170	
Meat type		100	
Turkey	7	105	85
Goose	24	15-60	215
Duck			
Egg type	6	250	70
Meat type	7	110-175	80
Pheasant	6-7	50-125	30
Quail	7 weeks	250	10
Pigeon	6	12-14	17
Guinea Fowl	6-7	100	40
Ostrich	3-4 years	20-70	1.0-1.5 kg

Food Value of Chicken Meat

Meat: The meat is flesh of animal, typically from mammal and birds. It is edible raw, but is normally eaten after it has been cooked, and seasoned or processed in a variety of ways. It is composed of water, protein, fat, vitamins, minerals, small quantities of carbohydrate and other bioactive components.

Nutritionally, people eat poultry meat for its high-quality protein and its low-fat content. Chicken meat is higher in protein and lower in fat than beef and other red meats. Human body needs protein for its cell structure and repair. Poultry meat is a great source of protein with all essential amino acids. Poultry meat is very nutritious food for all ages of peoples. Poultry meat contains less fat than animal.

Composition of meat of Chicken, Beef, pork and chevon (100g)

Species	Water%	Protein%	Fat%	Ash%	Energy (KJ)
Chicken	75	22.8	0.9	1.2	439
Beef (Lean)	75	22.3	1.8	1.2	485
Veal (Lean)	76.4	21.3	0.8	1.2	410
Beef (Carcass)	54.7	16.5	28.0	0.8	1351
Pork (Lean)	75.1	22.8	1.2	1.0	469
Pork (Carcass)	41.1	11.2	47.0	0.6	1975
Goat meat	75	21.5	2.5	1.1	-

Effect of Eating Raw and Cooked Eggs

Eating of raw egg

Since the nutrients in the eggs are in an easily digestible form, and also because the chick embryo can utilize these nutrients from the raw contents, one may think that it is preferable to consume the egg contents in the raw state rather than after cooking. But this is not so far the following reasons:

1. Raw egg white (albumin) contains an *anti-trypsin* factor and also particular protein, *avidin* which are in combination of vitamin *biotin* thus render the vitamin unavailable. But by cooking harmful properties of albumen are destroyed and it also become more digestible.

2. The raw egg may contain harmful organisms capable of causing diseases. The organisms will be destroyed by cooking temperature.

3. Cooked eggs also stimulate more secretion of the acid in the stomach required for protein digestion.

Eating of cooked egg

There is several types' of egg cooking methods. High or low temperature influence digestion of egg and even loss of nutrients.

1. **Egg boil:**
   Egg half boiled: There is no loss of protein and vitamin in half boiling.
   Egg full boiled: Trace loss of nutrients.
2. **Egg fry:**
   Fried at low temperature - If frying is done at low temperature, only about 0.1 gm protein (out of 6.5 gm) may be lost.
   Fried at high temperature -At high temperature 0.6 gm protein and significant amount of vitamins are lost.
3. **Egg omelette:** The loss of protein is about 0.2 gm (fried with spices)
4. **Egg poach :** The loss of protein is about 0.5 gm.(broken egg in boil water)
5. **Egg scrambled:** The loss of protein is about 1.0 gm.
6. **Spiced egg curry:** Indian type curry with other foods, loss of protein is 1.2 gm with vitamins.