

Fact sheet on the benefits of eggs

Eggs have been recommended by nutritionists, paediatricians and activists because of its numerous benefits. Since many misconceptions around eggs, here are some facts about eggs.

Nutrient content of eggs

Eggs are a rich source of all nutrients except Vitamin C. Each egg has a biological value (BV) of 96, Net Protein Utilization (NPU) of 96, Protein Efficiency Ratio (PER) of 3.8 and no limited amino acid compared to rice which has a BV of 80, NPU of 77, PER of 1.7 and limiting amino acids lysine and threonine.¹ Digestibility of egg is 97% which is superior to most other foods which may have nutrients but these are not as bioavailable because of low digestibility. In fact, egg protein is considered a reference protein for all other foods.²

100 gm egg contains 13.3 gm protein, 13.3 gm fat, 60 mg calcium, 220 mg phosphorus, 2.1 mg iron, 420 micrograms carotene, 0.1 mg thiamine, 0.4 mg riboflavin, 0.1 mg niacin, 1.8 micrograms B12. Each 60 gm egg can provide 8-10 gm of the recommended 12 – 20 gms of protein each day. Each of these nutrients serve different functions

1. Vitamin A is required for normal immune function, vision and healthy skin
2. Vitamin B2 for release of energy and a healthy nervous system
3. Vitamin B5 for energy production and mental performance
4. Vitamin B12 for immunity and brain/nervous system development and functioning
5. Vitamin D for strong bones and teeth, healthy muscles and immune function
6. Vitamin E which is an antioxidant
7. Iodine for brain development and cognitive function
8. Iron to ensure adequate hemoglobin which can cause anemia if deficient.
9. Selenium required for normal immune functioning.
10. Phosphorus for strong bones and teeth.
11. Egg contains some fat which is a concentrated source of energy, makes food palatable and is essential for absorption of fat soluble vitamins.
12. Vitamin A is required for vision and integrity of epithelial cells.

1 Gopalan C, BV Rama Sastri and SC Balasubramanian, 1989, *Nutritive value of Indian Foods*, National Institute of Nutrition, ICMR, Hyderabad

2 Swaminathan M, 1988, *Essentials of food and nutrition*, Bappco, Bangalore.

13. Choline which is important for development and functioning of children's brains and cell integrity. Choline deficiency has been associated with stunting in young children and intervention with egg improves linear growth.
14. Docosahexaenoic acid (DHA) important for growth and neurodevelopment. Deficiency is associated with learning difficulties, depression and cognitive dysfunction, particularly seen in formula fed infants.

Randomized controlled trials have demonstrated a benefit of egg consumption in infants. Infants 6-9 months, who consumed one egg per day for six-months showed increased linear (length for age) and weight for age compared to a control group of children who did not consume eggs, as well as a reduced prevalence of stunting and underweight. Infants 6-24 months who consume eggs show better protein, lutein, zeaxanthin, choline, B12, selenium and phosphorus.³ Studies from Ecuador and Bangladesh show reduced prevalence of stunting and improved linear growth in children after consuming eggs every day. Cholesterol Limit was removed from 2015-2020 Dietary Guidelines as a nutrient of concern.

What are the other advantages of distributing eggs in MDM?

Eggs are eaten by a majority of children in government schools therefore it is a very well accepted food culturally. Parents and grandparents are aware of the benefits of eggs and since they may not be able to afford eggs everyday they strongly value distribution of eggs as part of the mid-day meal.

Given the high levels of stunting and undernutrition in Karnataka, there is likely to be deficiency of many other nutrients so giving a nutrient dense food like eggs can address several deficiencies that they children are vulnerable to. This is likely to have aggravated due to the Covid pandemic and lockdown.

In India, cultural acceptance of egg is also high. Data for Karnataka from the National Family Health Survey shows that at least 83% of the state's population doesn't have any cultural or religious objections to consumption of eggs. And that 4 out of 5 persons in the state is not-vegetarian. There is also evidence that attendance in schools improves and children enjoy their

³ Papanikolaou Y, Fulgoni VL 3rd. Egg Consumption in Infants is Associated with Longer Recumbent Length and Greater Intake of Several Nutrients Essential in Growth and Development. *Nutrients*. 2018 Jun 4;10(6):719. doi: 10.3390/nu10060719. PMID: 29867006; PMCID: PMC6024369.

food and eat larger quantities when eggs are provided as part of the mid-day meal in schools.

Eggs are also found to reduce the incidence and prevalence of non communicable diseases such as diabetes. A study, published in American Journal of Clinical Nutrition, found that men who ate approximately four eggs per week had a 37 percent lower risk of Type-2 diabetes than men who ate only one egg a week. Researchers at the University of Eastern Finland assessed dietary habits of 2,332 men aged between 42 and 60 years during 1984-1989. The study found that egg consumption was associated with a lower risk of Type-2 diabetes as well as with lower blood glucose levels.

Eggs are also easy to store, transport, less prone to adulteration/pilferage and corruption and can be produced locally in the communities that the schools are located. Despite being the third largest producer of eggs, only one-third Indian households reportedly consume eggs. Rural household had a very low per capita consumption of eggs (1.94/month) as compared to urban (3.18/month).

Recommended quantity of eggs for mid-day meals?

Children require more protein per unit body weight than do adults because of new tissues which are being laid down during growth are largely built from amino acids drawn from the dietary proteins. Additionally, many children in government and government aided schools are malnourished and have many nutrient deficiencies, so they may require additional nutrition support apart from one egg a day. There is a need to promote daily consumption of one full egg by a child. The National Institute of Nutrition recommends 'egg as a complete food for children'.