

# Designer Egg Production in Poultry



**Department of Animal Nutrition**



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# Introduction:-

Designer Egg are those in which the Nutrient content has been modified from standard egg, it more healthy.

It is produced by feeding egg laying hens with special diet rich in certain vitamin and other nutrients .

The special diet usually includes kelp, flax seed, canola oil and marigold extract .





Modification of fatty acid in  
egg composition  
By Cruick Shank in 1934.

Professor Sim Designer in  
1990.

Modification of vitamin in  
egg by Michella and slaugh.

Herbal Egg by Naharari  
2004.

# Classification :-



Vitamin enrichment egg



Low Cholesterol egg



Fatty acid enrichment egg



Mineral enrichment egg



Pigment Enriched Egg



Herbal Enriched Egg



Antioxidant Enriched Egg



Immunomodulating Egg

# 1. Vitamin Enrichment Designer Egg :-

Specially Vit A & E .

Depend on concentration of vit. in diet .

**Vit E Enriched Egg:-** It is in form of Tocopherol and Tocotrienol

Vit E is one of most imp in vivo antioxidant

Omega -3 enriched egg → lipid oxidation → given vit E

level of dietary vit E in feed 100IU\Kg in omega -3 egg

Designer Egg have **26 time** more vit E than other egg

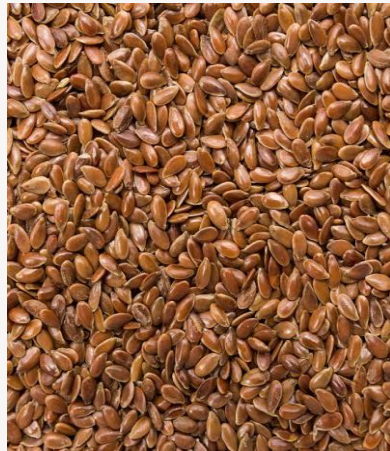
1.1mg of vit E is equivalent to 8.5 % RDA

**source** – vegetable oil, meat, milk, butter etc



## 2. Low Cholesterol Enriched Egg :-

- Egg contain 200 to 220mg of cholesterol
- Can reduce 50% lower cholesterol either by
  - a) Inhibiting transfer of cholesterol
  - b) Inhibiting synthesis of cholesterol
- Chromium (1ppm), Zn, I, vit A, Vit C can lower cholesterol
- Low energy consumption – lower the egg cholesterol level
- Garlic and lactobacillus – reduce yolk cholesterol
- **Source :-** 1.5% Menhaden Fish Oil  
5% Ground Flaxseed





# 3.Omega -3 Enriched Egg :-

- Designer egg have 25% less cholesterol than regular egg
- Imp omega -3 fatty acid docosahexaenoic acid, eicosapentaenoic acid, from fish oil
- Alpha linolenic acid from plant oil
- Omega -3 obtained by -
  - i. Marine type (DHA, EPA ) – cold water fish, tuna, bluefish, marine algae.
  - ii. Terrestrial type (LNA) – canola oil, soyabean oil, flaxseed, spinach.



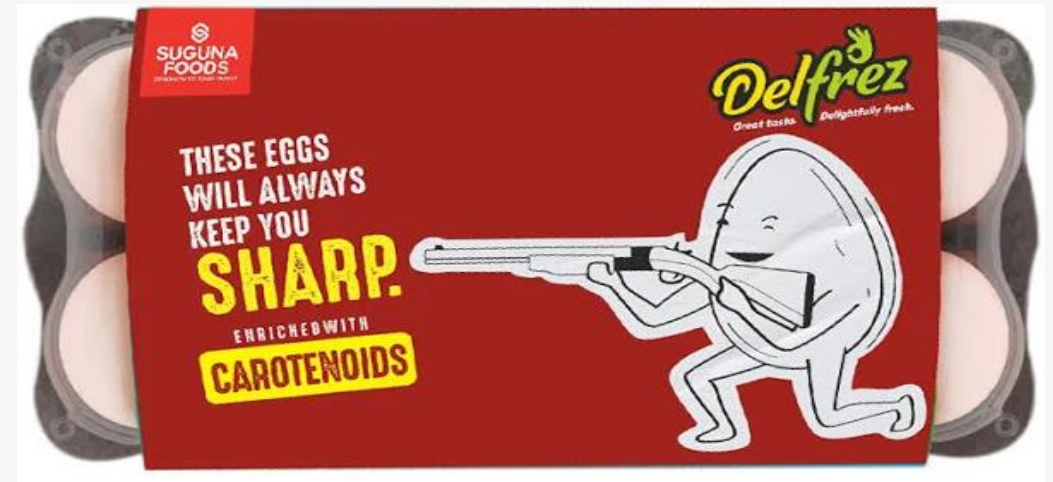
## 4. Mineral Enriched Egg :-

- Many type of mineral can be enriched in production of designer egg , among them se, cu, I.
- **Selenium enriched egg :-**Reducing oxidative damage of cell membrane
- Essential part of selenoprotein i.e. glutathione peroxidase (GSH-Px)
- source – corn soyabean meal
- Sel –Plex™ at 0.3mg/kg – higher albumin value
- Max allowable level of se in diet is 0.3ppm



## 5. Pigment enriched egg :-

- Color of yolk is reflection of its pigment content
- Natural carotenoid pigment(hydroxy compound in yolk ) like carotene, xanthophyll, lutein present in alfalfa, corn gluten meal, blue green algae , marigold petal
- Feed at 1-5% level to increase the yolk color



## 6. Herbal enriched egg: -

- Phytobiotics or plant derived product containing secondary metabolites used in poultry feed and to produce herbal egg.
- Feeding with herbs likes garlic/onion leaves, basil leaves, turmeric powder etc.
- Have lower LDL cholesterol, antioxidant,  $\omega$ -3.
- Normal egg contains vit-E about 90-100  $\mu\text{g/g}$  yolk whereas herbal egg 220-240 $\mu\text{g/g}$  yolk .



## 7. Pharmaceutical Designer Egg:-

Specific antigen injected into hen body



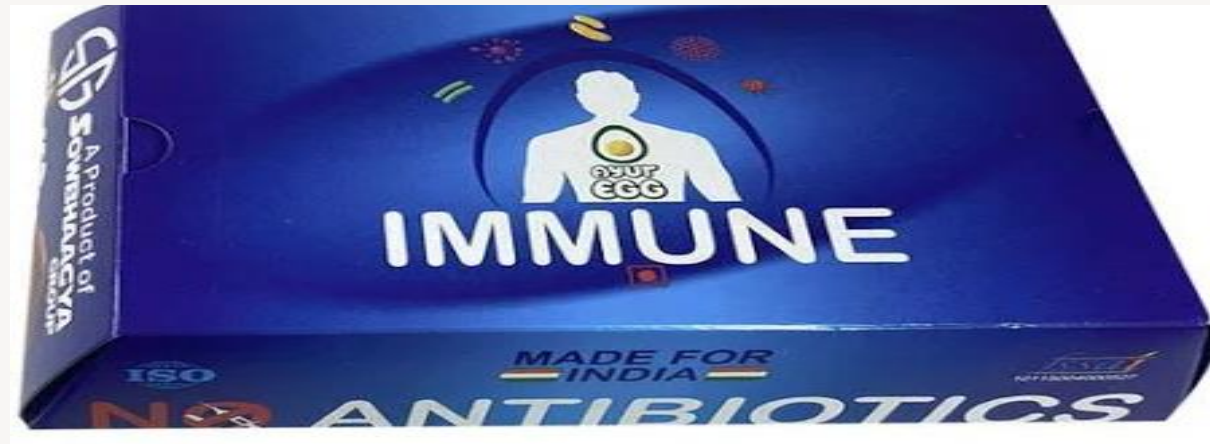
Antibody formation start and flow in blood, then in egg

Collection of antibody from the egg and use in human health care

## 8. Immunomodulating egg :-

The egg natural contain lysozyme, antibiotic etc.

The globulin antibodies are natural antimicrobial and immunostimulant



## Quantity per 100g of egg content (2 eggs)

Nutrient content	Ordinary egg	Designer egg
PUFA	2g	2.5g
N6\n3 ratio	17.3	1.27
cholesterol	400mg	200mg
carotenoids	1.5mg	2.2mg
Vit E	2mg	15mg
selenium	Traces	1.8µg
Chromium	Traces	1µg

Quantities depend upon their level in feed ( Narahari, 2005)

# References :-

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THANK YOU!

