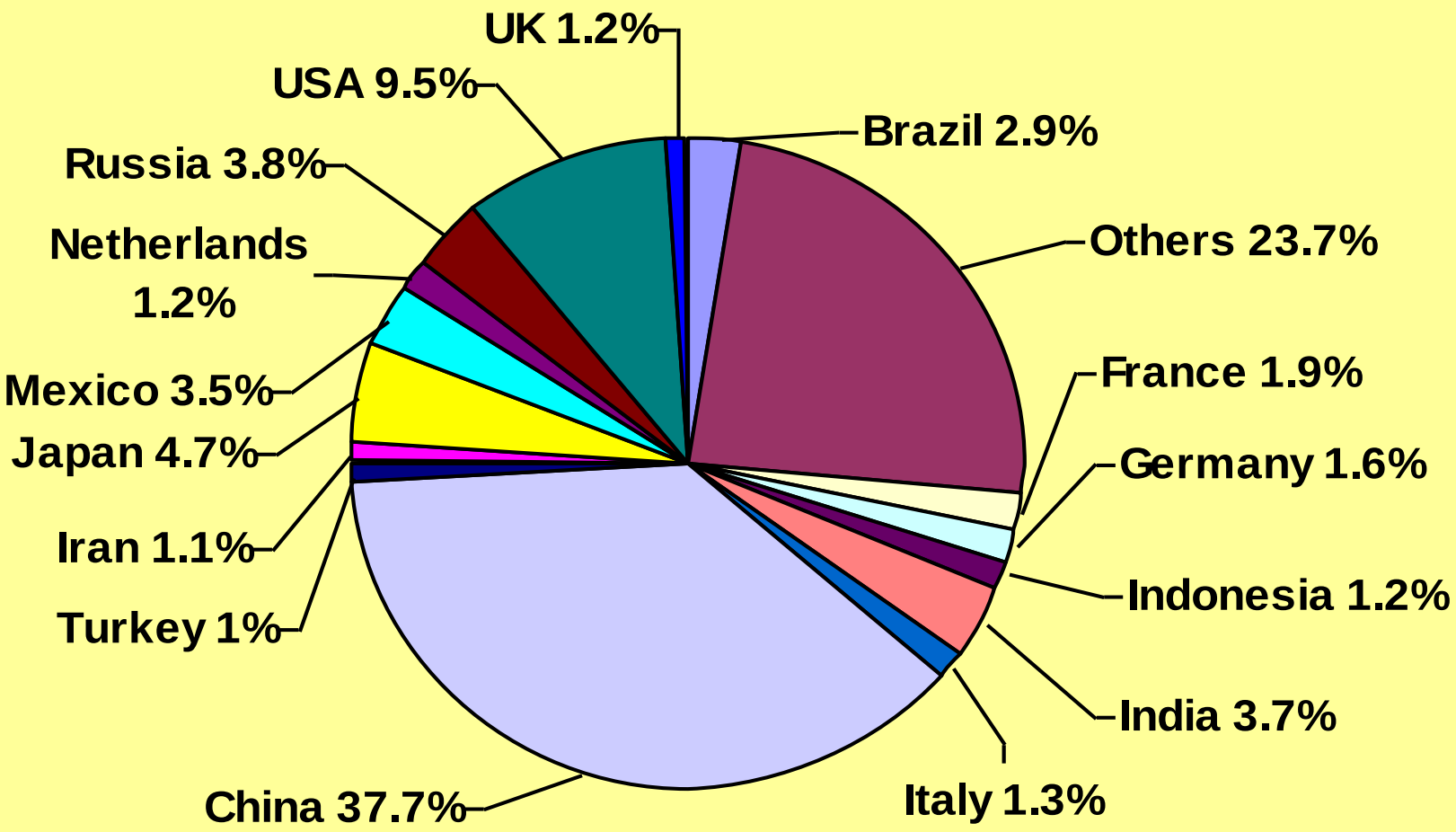
Egg Nutrition

Sukardi, S.Pt., MP

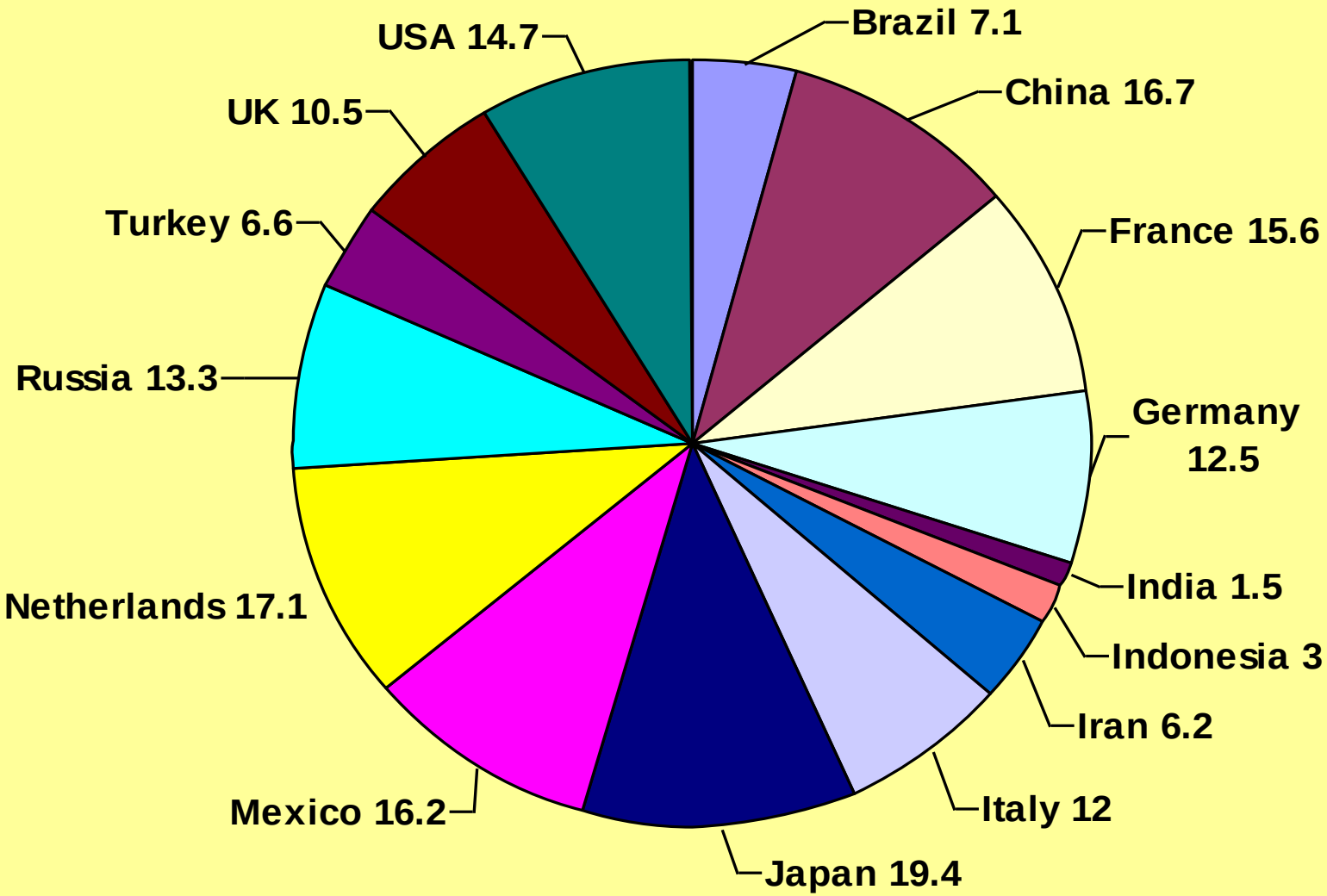
Regional Egg Production (all types in million metric tons)

Region	2001	2015	2030
Asia	33.92	43.37	56.62
Africa	2.08	3.21	5.13
Europe	9.65	10.64	11.22
North & Central America	7.81	8.76	10.74
South America	2.92	4.13	5.82
Oceana	0.22	0.34	0.41
World	56.94	70.44	89.94

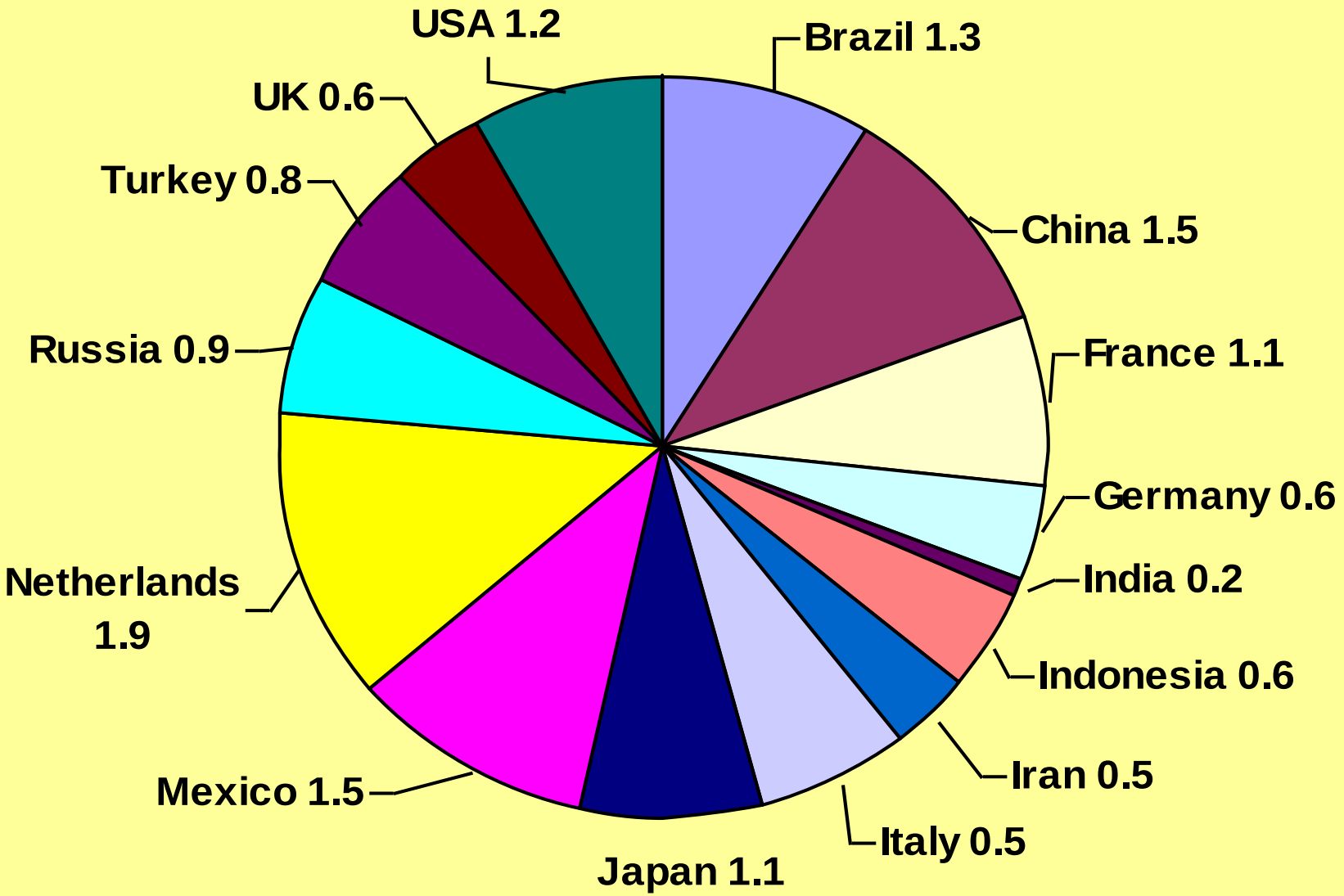
Percentage of World Egg Production (in MT for 2002)



Egg Consumption per Capita
2001 KGS



Number of Hens per Person 2002



Projected per capita broiler consumption in selected countries

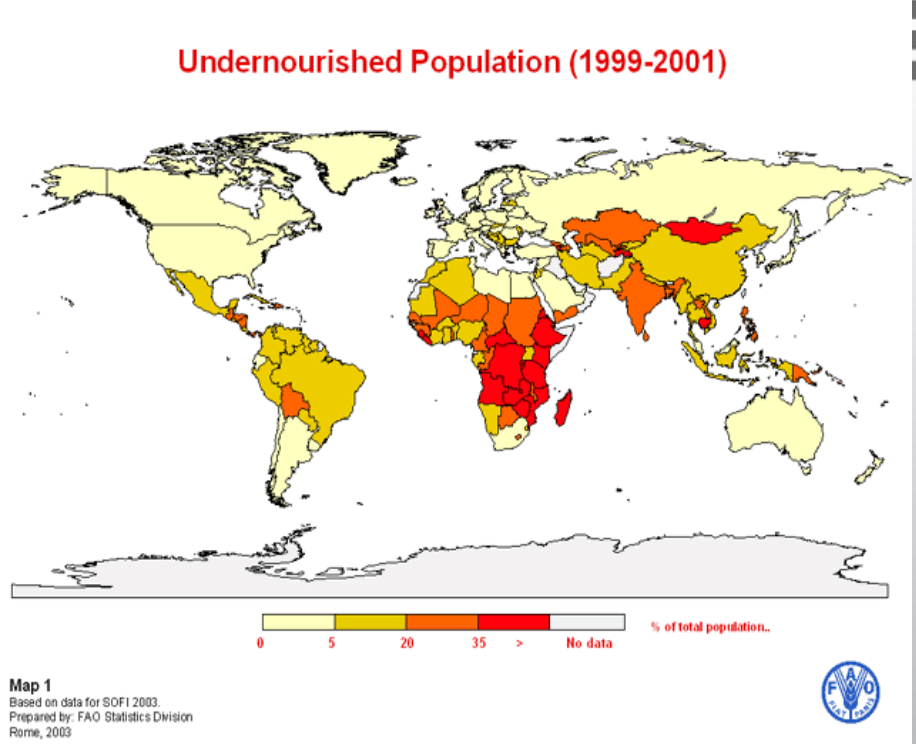
(1994-2014; ready-to-cook weight equivalent in kg)

	1994	1995	2000	2003	2004	2005	2006	2007	2008	2009	2010	2014
Argentina	20.6	20.3	24.0	18.6	21.1	23.1	23.6	23.8	24.1	24.3	24.6	25.8
Australia	24.6	24.5	29.2	30.6	31.7	33.2	34.2	34.6	34.9	35.2	35.5	36.7
Brazil	18.2	22.1	29.1	31.5	31.8	33.0	33.9	34.4	34.8	35.2	35.7	38.0
Bulgaria	0.0	11.0	14.1	15.9	16.4	16.9	17.2	17.7	18.2	18.7	19.0	20.6
Canada	25.0	24.8	28.6	29.2	30.1	30.0	29.4	29.9	30.5	31.0	31.1	32.3
China-Mainland	5.1	6.3	7.4	7.7	7.4	7.9	8.3	8.5	8.7	9.0	9.2	9.9
China-Hong Kong	47.0	39.5	35.0	31.1	31.7	33.2	33.2	33.5	33.7	34.0	34.1	34.9
Egypt	4.8	5.2	6.6	6.4	6.4	6.5	6.8	7.1	7.4	7.6	7.9	9.2
EU-New Member States	0.0	0.0	13.2	15.9	16.0	16.1	16.6	17.1	17.4	17.8	18.2	19.8
European Union - 15	0.0	0.0	15.7	15.4	15.7	16.1	16.4	16.5	16.7	16.8	17.0	17.7
India	0.6	0.6	1.1	1.5	1.5	1.6	1.6	1.7	1.7	1.7	1.8	1.9
Indonesia	n.a.	2.5	2.1	3.1	2.6	2.8	2.9	3.0	3.1	3.1	3.2	3.4
Japan	12.8	13.7	14.0	14.5	12.9	13.4	14.3	14.7	14.7	14.7	14.7	14.9
Mexico	16.3	16.3	21.6	25.3	26.2	26.8	27.1	27.7	28.2	28.9	29.2	31.3
New Zealand	21.0	24.7	22.9	34.6	37.3	39.2	40.4	41.0	41.3	41.6	42.1	43.6
Philippines	n.a.	5.6	6.7	7.7	7.8	8.1	8.3	8.5	8.7	8.7	8.8	9.5
Romania	7.0	6.7	6.7	11.8	12.2	12.6	13.7	14.3	14.7	15.2	15.7	17.6
Russia	6.2	8.0	9.0	11.6	11.0	11.8	12.3	12.6	12.8	13.0	13.2	14.0
South Africa	14.3	16.3	17.5	20.9	20.2	20.6	21.2	21.5	22.1	22.7	23.3	25.0
South Korea	n.a.	8.9	9.7	10.7	9.3	10.4	10.8	11.2	11.4	11.8	12.1	13.2
Taiwan	n.a.	23.7	29.0	27.8	27.8	28.8	29.0	29.4	30.0	30.5	30.9	32.9
Thailand	9.1	10.2	11.9	12.7	8.4	10.3	12.0	13.0	13.2	13.4	13.5	14.3
Ukraine	0.9	1.7	0.9	4.6	6.8	7.5	8.0	8.3	8.6	8.8	9.1	10.3
United States	35.6	35.4	40.6	43.2	44.9	46.6	46.9	47.2	47.6	48.2	48.9	51.4

Rakyat Indonesia Membutuhkan Nutrisi yang lebih Tinggi

- **Menurut data statistik FAO 20 % dari rakyat Indonesia masih kekurangan asupan nutrisi**
- **Laporan UNICEF (2006)**

  Jumlah Balita Gizi Buruk meningkat dari 1.8 juta menjadi 2.3 juta orang



Konsumsi beberapa jenis pangan per kapita per tahun rakyat Indonesia:

Beras: 133 kg (Tertinggi di dunia)

Ayam: 3.8 kg (Malaysia 23 kg, Thailand 16.8 kg, Filipina 8.1 kg) Indonesia ber potensi bertambah 2 kg dalam waktu 5 tahun yang akan datang berarti tambahan kebutuhan 400 juta/ kg tahun

Telur: 52 butir (Malaysia 240 btr, Thailand 100 btr,
Filipina 70 btr,) Indonesia berpotensi bertambah 10 butir dalam 5 tahun yang akan datang, berarti

Konsumsi beberapa jenis pangan per kapita per tahun rakyat Indonesia:

Ikan : 12.5 kg

(Rata-rata dunia 16 kg)

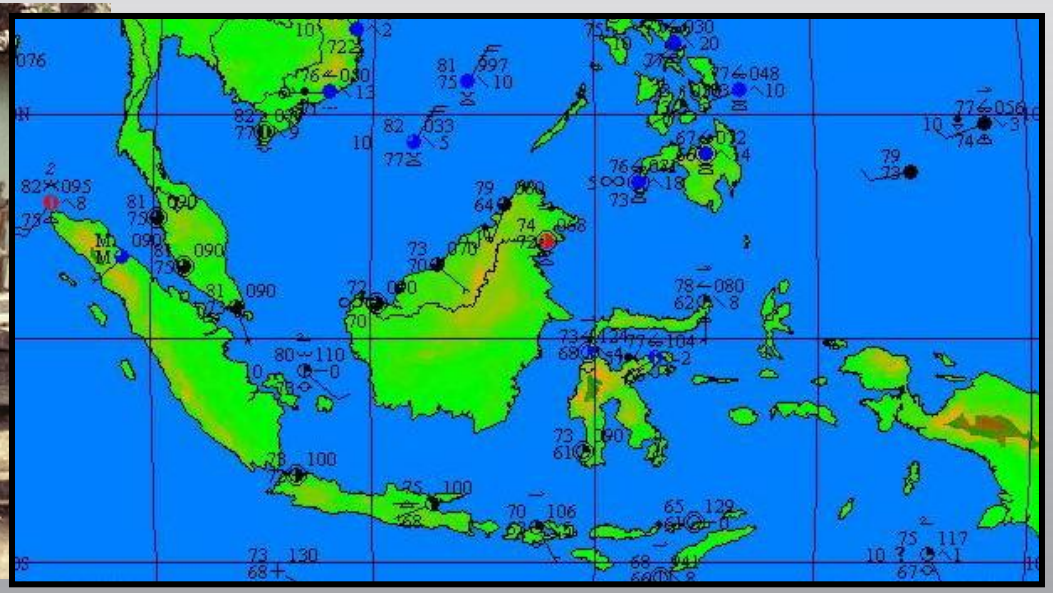
Sayur-sayuran : 37.94 kg

(USA 95 kg, rekomendasi FAO 65.75 kg)

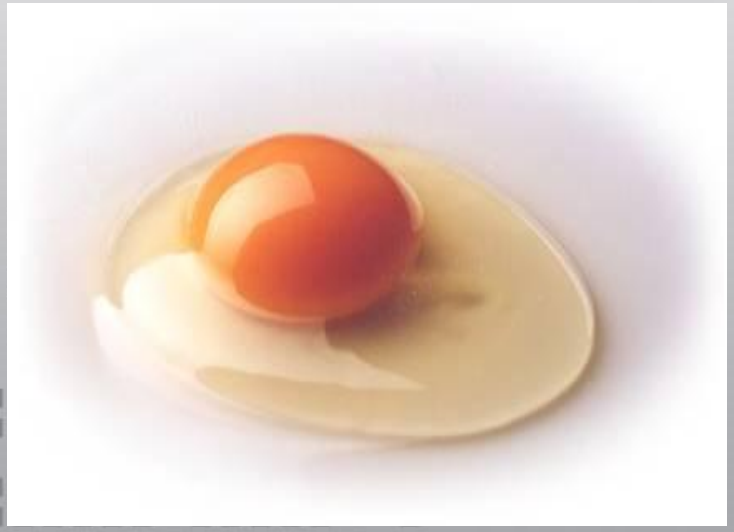
Buah-buhan : 40.06 kg

(Jepang 120 kg, USA 75 kg, rekomendasi FAO 65.75 kg)

Dari semua sumber protein yang tersedia di Indonesia, Telur sangat berpotensi untuk meningkatkan gizi rakyat Indonesia



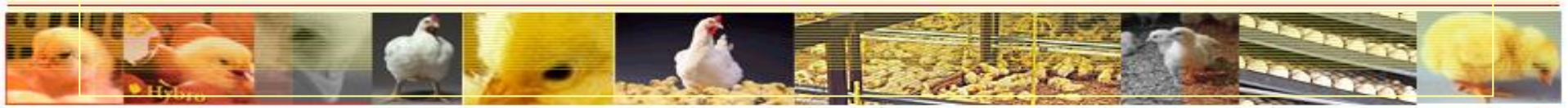
Natures Original Functional Food



- Efficient Ovoid Container
- High Quality Protein
- Significant Levels of Beneficial Vitamins
- Contains Other Natural Compounds Like Yolk Pigments That Improve Health
- But Egg Can Be Improved By Modifying the Chicken Feed

Egg Proteins

- Chemical score (essential amino acid level in a protein food divided by the level found in an “ideal” protein food) = 100.
- Biological value (a measure of how efficiently dietary protein is turned into body tissue) = 94.
- Protein Efficiency Ratio (PER : ratio of grams of weight gain to grams of protein ingested in young rats) highest of any dietary protein.



Biological Values

Biological Values of Proteins in Different Foods

• Whole Egg	93.7
• Milk	84.5
• Fish	76.0
• Beef	74.3
• Soybeans	72.8
• Rice, polished	64.0
• Wheat, whole	64.0
• Corn	60.0
• Beans, dry	58

Macronutrient Composition of Raw Eggs (per 100 g)

	FOWL SPECIES				
	Quail	Chicken	Duck	Turkey	Goose
Average Wt	9 g	50 g	70 g	79 g	144 g
Water (g)	74.35	75.84	70.83	72.50	70.43
Energy					
~ kJ	663	617	776	716	775
~ kcal	158	147	185	171	185
Protein (g)	13.05	12.58	12.81	13.68	13.87
Lipid (g)	11.09	9.94	13.77	11.88	13.27
Cholesterol (mg)	844	423	884	933	852

Macronutrient Distribution in Raw Chicken Egg (per 50 g)

	Whole Egg	Egg Albumin	Egg Yolk
Weight (%)	100	66	34
Water (g)	37.9	28.9	8.9
Energy			
~ kJ	308.5	71.3	228.8
~ kcal	73.5	17.2	54.7
Protein (g)	6.29	3.60	2.70
Lipid (g)	4.97	0.06	4.51
Sugars (g)	0.39	0.24	0.10

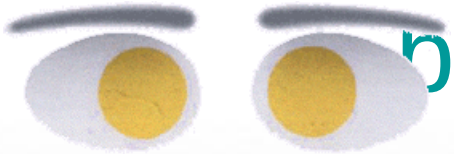
Vitamin Content per 50g Large Egg

Vitamin	Whole	Albumin	Yolk
Niacin	0.04 mg	*0.04*	<0.01 mg
Riboflavin	0.24 mg	*0.15*	0.09 mg
Thiamin	0.04 mg	<0.01	0.03 mg
Vitamin B6	0.07 mg	<0.01	0.06 mg
Folate	23.5 µg	0	24.8 µg
Vitamin B12	0.65 µg	0.03	0.33 µg
Vitamin A	243.5 IU	0	245.1 IU
Choline	125.5 mg	0	125.5 mg
Retinol	70 µg	0	63.1 µg
Vitamin E	0.49 mg	0	0.44 mg
Vitamin D	17.3 IU	0	18.3 IU
Vitamin K	0.15 µg	0	0.12 µg

Mineral Content per 50g Large Egg

Mineral	Whole	Albumin	Yolk
Calcium, Ca (mg)	26.50	2.30	21.90
Iron, Fe (mg)	0.92	0.03	0.46
Phosphorous, P (mg)	95.50	4.95	66.30
Zinc, Zn (mg)	0.56	0.01	0.39
Selenium, Se (µg)	15.80	6.60	9.50
Magnesium, Mg (mg)	6.00	3.63	0.85
Potassium, K (mg)	6.70	53.79	18.53
Sodium, Na (mg)	70.00	54.78	8.16
Copper, Cu (mg)	0.05	0.01	0.01
Manganese, Mn (mg)	0.02	<0.01	0.01

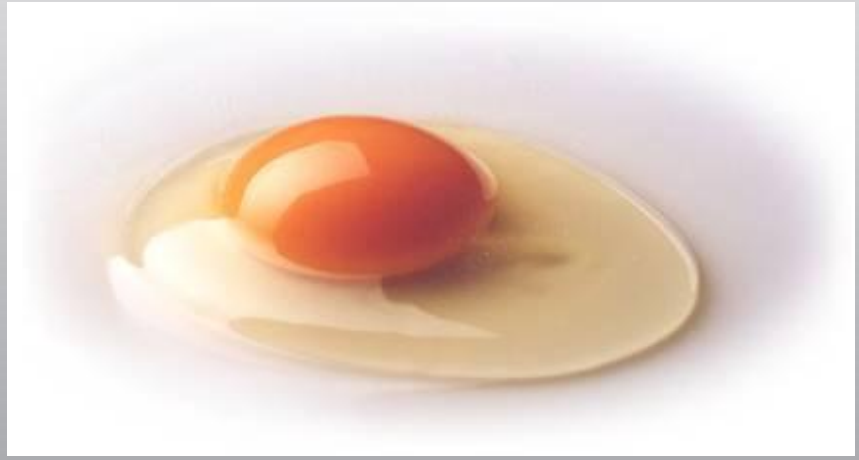
Percentage of Daily Value Provided by Two Large Eggs



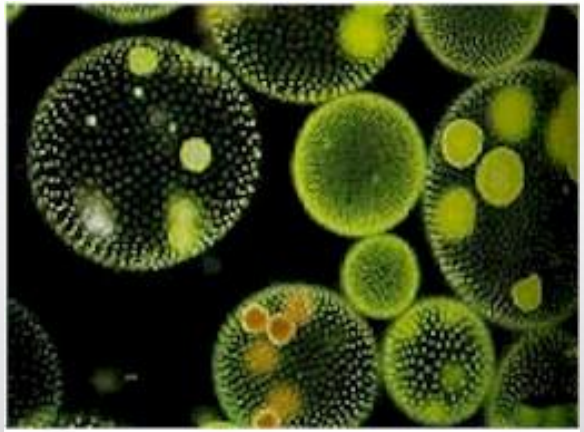
Nutrient	Percent (%) Provided	Nutrient	Percent (%) Provided
Energy	6	Iron	8
Protein	20	Riboflavin	30
Essential Amino Acids	53	Vitamin D	12
Vitamin B12	16	Phosphorus	16
Folate	12	Zinc	8
Selenium	34	Vitamin A	12
Vitamin B6	8		

Egg Yolks Contain Beneficial Pigments

- Lutein and Zeaxanthin important to eye health
  - Pigments in macular region of eye
  - Prevents macular degeneration which is leading cause of blindness in elderly
- Cataracts are the leading cause of blindness in world
  - Cataracts are also less in those people with high intake of Lutein and Zeaxanthin
- Pigments Act as Antioxidants to reduce damage
- Indonesia's Blindness rate one of highest in world
- Inverse relationship between dietary lutein and arteriosclerosis development



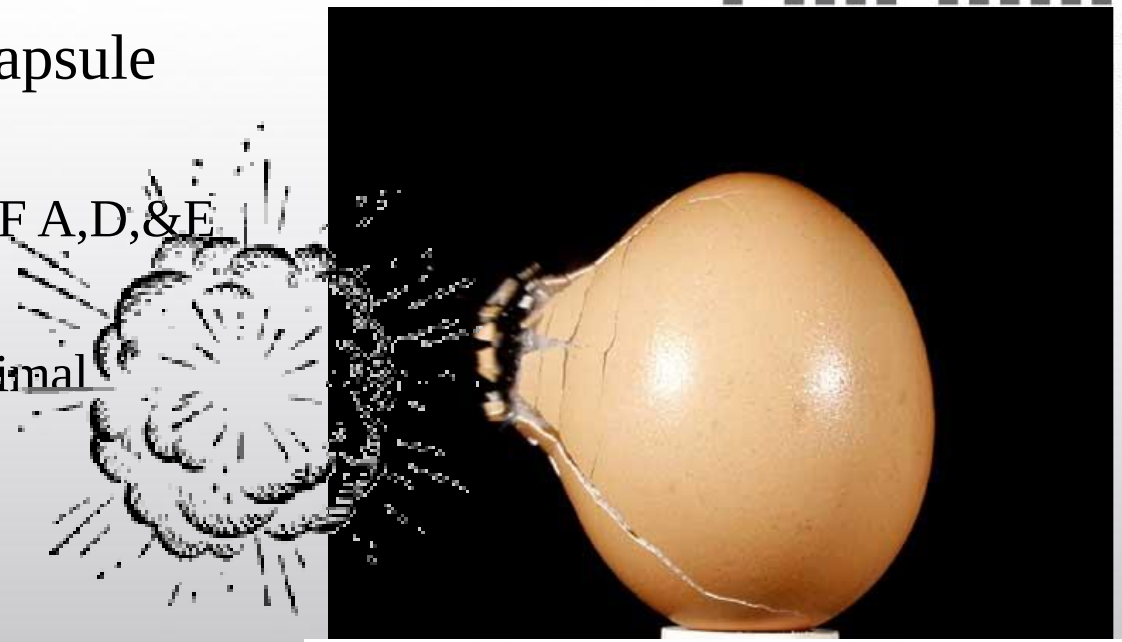
Feed Ingredients Determine Level and Type of Pigment in Egg and Yolk Color

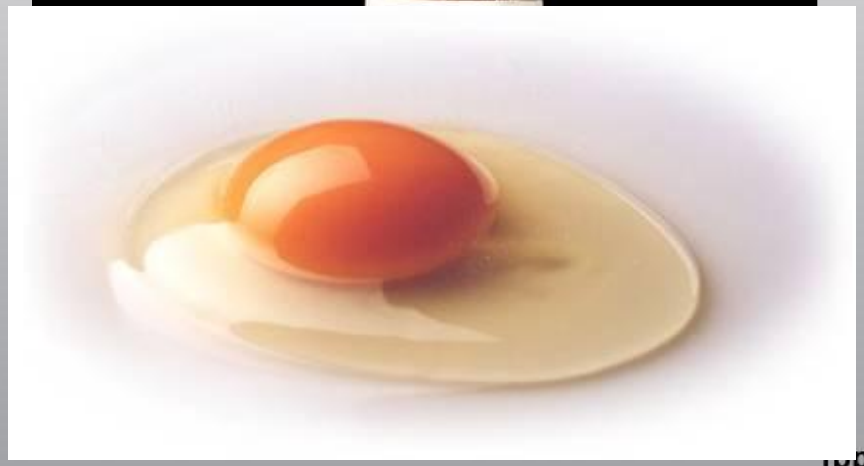


Algae

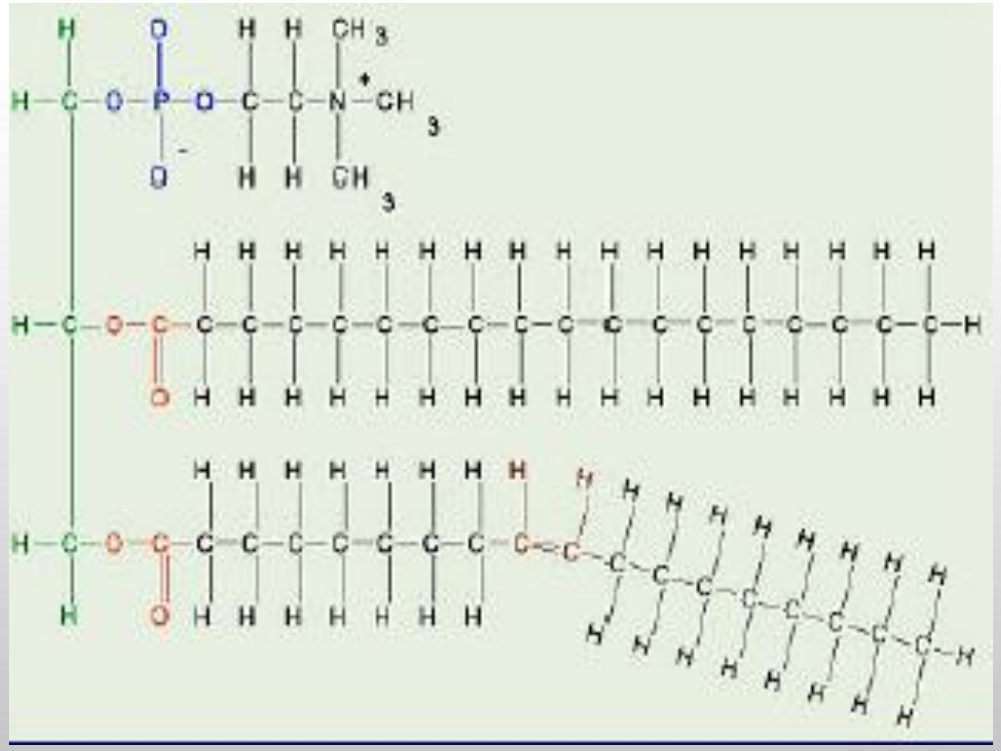
EGGS EXPODES WITH VITAMIN NUTRITION

- Natures Vitamin Capsule
- FAT SOLUABLE
  - HIGH LEVELS OF A,D,&E
- B VITAMINS
  - B12 (only from animal product)
  - CHOLINE
  - INOSITOL
  - RIBOFLAVIN
  - NIACIN
  - B6
  - THIAMINE
  - PANTOTHENIC ACID
  - FOLIC ACID
- No Vitamin C





Egg Lecithin



A yellow phospholipid essential for the metabolism of fats; found in egg yolk and in many plant and animal cells; used commercially as an emulsifier.

EGG CHOLINE

- Egg Lecithin
- Essential Nutrient (AI)
- Pregnancy / Lactation
- 50 g egg has 180 mg
- 2 large eggs 80% AI
- Excellent source

Eggs Come Full Circle

Egg Yolk Lipids

A large egg yolk contains 4.5 g of lipid :

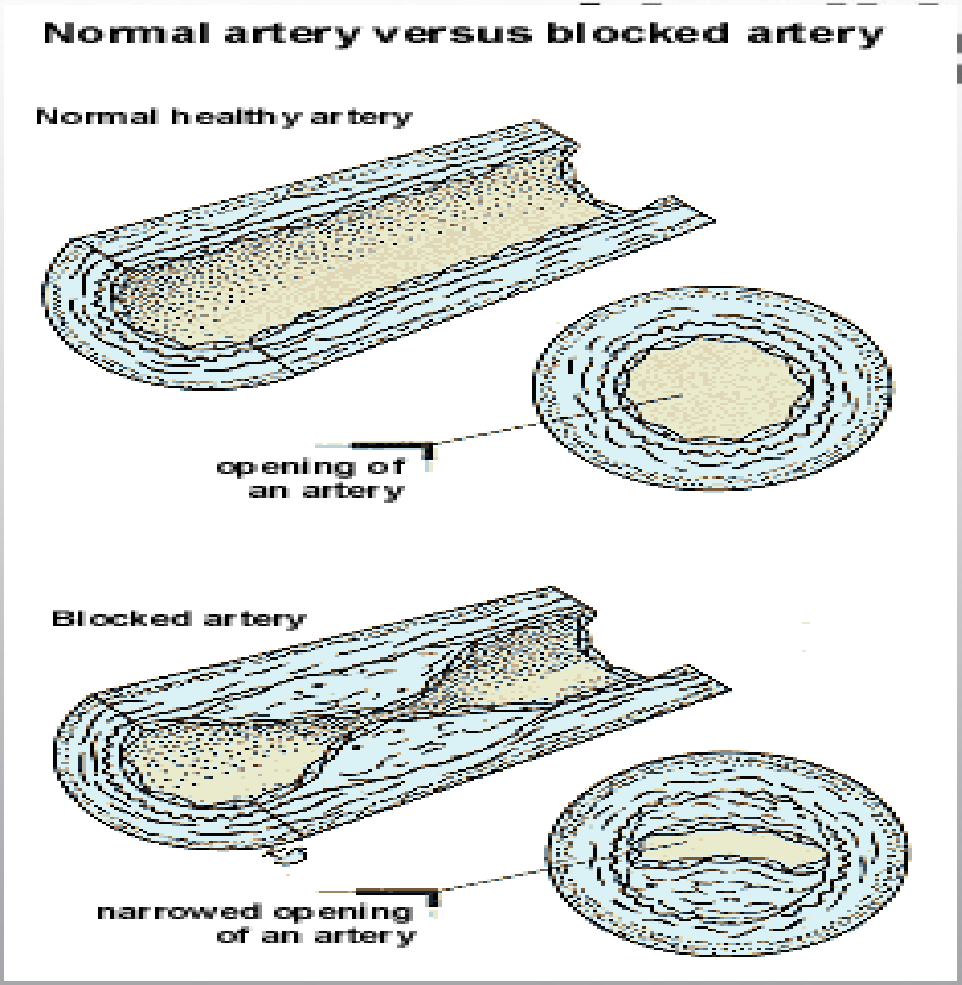
- Triacylglycerides = 65%
- Phospholipids = 31%
- Cholestrol = 4%

Yolk Lipids per 50 g Egg

Lipids	Amount
Fatty Acids	
• Saturated	1.55 g
• Monounsaturated	1.99 g
• Polyunsaturated	0.72 g
Trans-fatty Acids	< 0.05 g
Cholestrol	211 mg

Issue Negatif: "Koles-Telur-Fobia" sehingga takut makan telur

Telur dianggap sebagai provokator serangan stroke dan penyakit jantung koroner, serta didakwa menaikkan kolesterol



Apakah Kolesterol:

- Suatu zat lemak yang beredar di dalam darah, diproduksi oleh hati

Merupakan bagian dari membran sel dan myelin (pelindung serat saraf), khususnya saraf otak (11% berat otak adalah kolesterol)

- Pembentukan hormon seks, vitamin D dan asam empedu, serta pembentuk sel darah putih

Berapakah Kadar Kolesterol yang Normal?

Kolesterol total < 200 mg/dl

Kelesterol HDL 35-65 mg/dl

Kolesterol LDL < 150 mg/dl

Triglisereida < 200 mg/dl

Ratio kolesterol total : HDL < 5

Fakta Tentang Kolesterol:

- Hiperkolesterolemia diyakini para ahli *"dunia lama"*, sebagai akibat konsumsi kolesterol berlebihan; padahal dalam tubuh kita kolesterol disentesis oleh hati dari asetil koenzim A hingga jumlah 2000-3000 mg/hari

Semua zat gizi sumber kalori (karbohidrat, lemak dan protein) menghasilkan asetil koenzime A sebagai bahan baku kolesterol

Fakta Tentang Kolesterol:

- Kolesterol tidak dihasilkan oleh tumbuh-tumbuhan, jika ada iklan Minyak goreng X, Kacang Y, Beras Z tidak mengandung Kolesterol itu benar tapi menyesatkan.

Orang yang tidak mengkonsumsi kolesterol tapi mengkonsumsi bahan makanan sumber energi tinggi, akan memiliki kadar kolesterol darah yang tinggi

Fakta Tentang Kolesterol Telur

- Hasil penelitian Harvard School of Public Health terhadap 100.000 penduduk USA yang mengkonsumsi 1-2 butir per hari, hanya 1/3 responden yang terjadi peningkatan itupun hanya 3 mg/dl.

Tim Harvard menemukan bahwa zat gizi dalam telur antara lain: antioksidan, asam folat, dan komponen vitamin B lain bersifat counter balance terhadap naiknya kadar kolesterol darah.

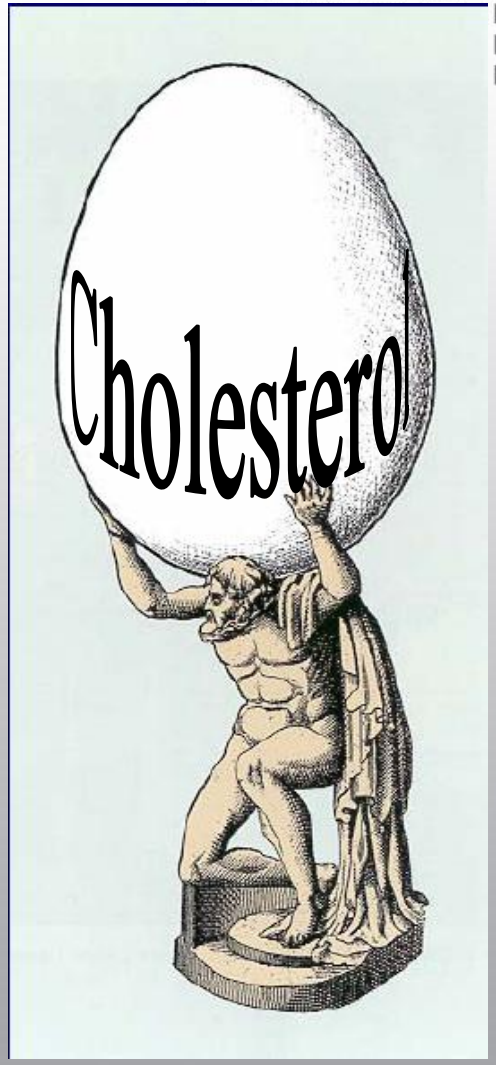
Fakta Tentang Kolesterol Telur:

- Dr Wanda Howell dari University of Arizona meneliti hubungan antara diet dan kolesterol darah terhadap 8000 responden selama 25 tahun. Kesimpulannya asam lemak jenuhlah yang berperan menaikkan kadar kolesterol darah.

- Jepang pengkonsumsi telur tertinggi di dunia justru memiliki tingkat kematian karena penyakit jantung koroner paling rendah, demikian juga Perancis

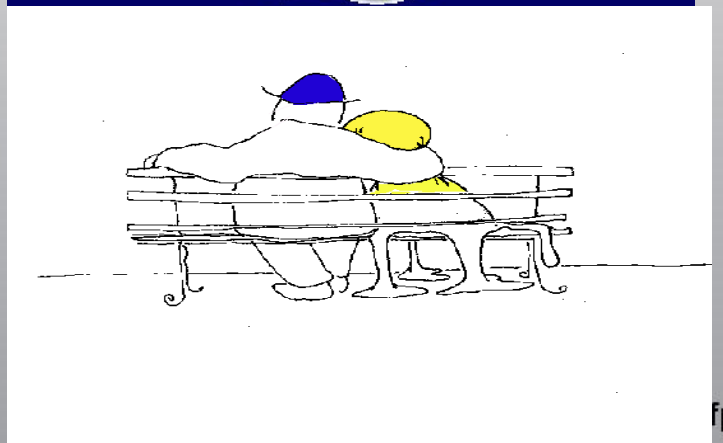
Due to Cholesterol the Positives Were Forgotten About Eggs

- High quality protein
- Essential vitamins and minerals
- Carotenoids
- Choline
- Satiety, glycemic index
- Affordability
- Convenience



Charoen Pokphand dan Kita Bangsa Indonesia Harus Mempromosikan Telur

- Eggs - delicious, nutritious, affordable, fast, health food



Beberapa hal yang perlu diketahui tentang pakan ternak

- Menggunakan bahan – bahan baku alami yang ada di alam melalui program least cost formulation

feed

Ingredients	%
Soybean oil meal (44% protein)	10
Fish meal (65-70% protein)	2
Fish Solubles	2
Dried Whey	2.5
Dehydrated Alfalfa Leaf Meal	3
Ground Yellow corn	20
Ground Milo or Grain Sorghum	52.25
Bone Meal or Dicalcium Phosphate	2
Oyster-shell Flour or Calcium carbonate	3.5
Salt	0.25
Vitamin and Mineral Mixture	2.5

From Profitable Poultry Production by E.D. Parnell, Professor TAMU 1967

feed

Ingredients	%
Soybean oil meal (48% protein)	28.00
Ground Yellow corn	60.64
Fat	2.00
Bone Meal or Dicalcium Phosphate	1.20
Limestone	7.80
Methionine	0.01
Salt	0.25
Vitamin and Mineral Mixture	0.10

Source: Summer and Lesson

feed

Ingredients	%
Soybean oil meal (48% protein)	15.50
Ground wheat	69.00
Dehydrated Alfalfa meal	2.84
Fat	2.50
Bone Meal or Dicalcium Phosphate	1.20
Limestone	7.60
Methionine	0.01
Salt	0.25
Vitamin and Mineral Mixture	0.10

Source: Summer and Lesson

Terima Kasih