

# Importance and Role of Protein in the Indonesian Daily Diet

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- \*) Presented at "Whey Protein Health and Fitness Seminar", Jakarta, 13 July, 2011
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# Importance and Role of Protein in the Indonesian Daily Diet

Start

- **Overview of protein intake in Indonesia/Southeast Asian region**
  - ✓ Dietary recommendations on local protein requirement (including men vs. women)
  - ✓ Current protein intake levels; are people getting enough?
  - ✓ Sources and quality of protein
- **Opportunities for whey protein in the local diet and health context**
  - ✓ Where can whey protein play a role?
  - ✓ Advice on incorporating whey protein into the daily diet

END



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## The word “protein”

*Dr. Ponnusamy (2010), Rutgers U*

Derived from the Greek word *proteios*, which means “of the first rank”

Coined by Jon Berzelius (Swedish chemist)

*discovered that an extract of potatoes is more effective than concentrated sulfuric acid in promoting the breakdown of starch*



Jons Berzelius (1779-1848)  
Figure 1.1



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## *Proteios* → “**of the first rank**”

*Dr. Ponnusamy (2010), Rutgers U*

- No living tissue can be built without protein
- Protein is part of every living cell
- Proteins account for ~ 20% of body weight
- Proteins come in many forms
- Proteins perform many vital functions



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# Vital Functions of Protein

Dr. Ponnusamy (2010), Rutgers U

- **Biological Processing**
  - **Enzymes** – over 2000 – catalyze reactions
  - **Hormones** – regulate metabolic reactions
  - **Immune functions** - antibodies (immunoglobulins)
- **Transport and Storage**
  - hemoglobin, myoglobin, lipoproteins
- **Structural for Mechanical Support**
  - keratin, collagen, elastin
  - body structures include skin, hair, nails, membranes, muscles, teeth, bones, organs
- **Contractile (Muscle proteins)**
  - myosin, actin, tubulin

Protein plays important role

Protein Intake in Indonesia/ Southeast Asian region

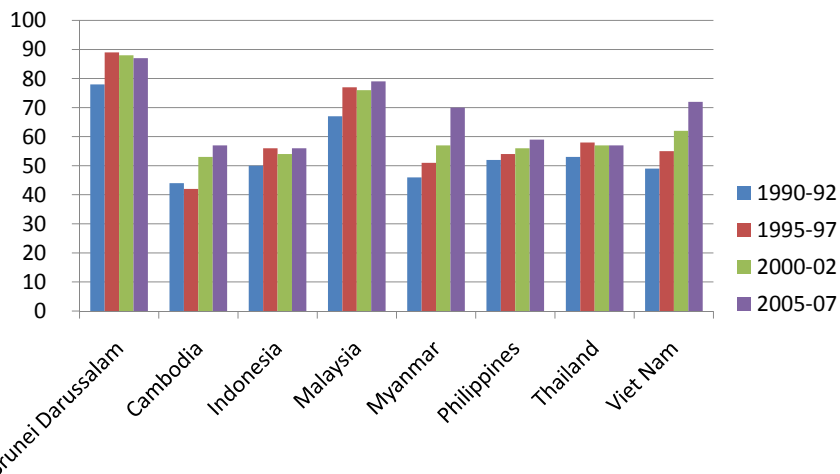
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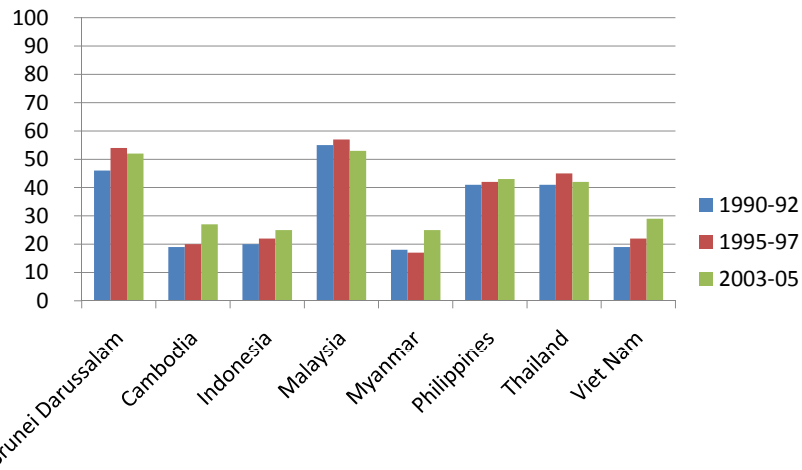
## Dietary Protein Consumption (g/person/day) of selected ASEAN Countries

(<http://www.fao.org/economic/ess/ess-fs/fs-data/ess-fadata/en/>)



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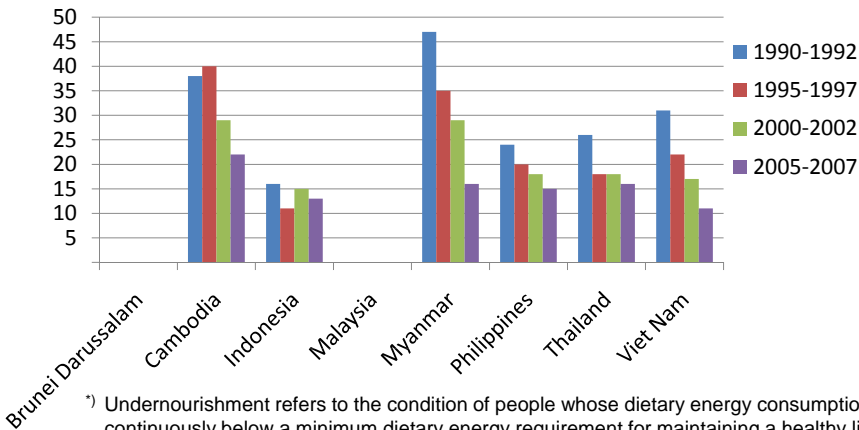
**Dietary Animal Protein Consumption (g/person/day) of selected ASEAN Countries** (<http://www.fao.org/economic/ess/ess-fs/fs-data/ess-fadata/en/>)



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**Prevalence of undernourishment\* in total population (percentage) of selected ASEAN Countries**

(<http://www.fao.org/economic/ess/ess-fs/fs-data/ess-fadata/en/>)



\*) Undernourishment refers to the condition of people whose dietary energy consumption is continuously below a minimum dietary energy requirement for maintaining a healthy life and carrying out a light physical activity with an acceptable minimum body-weight for attained-height.

**Brunei Darussalam & Malaysia : less than 5 %**



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## RDA (*Recommended Daily Allowance*) for Protein = Recommended Protein Intakes

- Dietary recommendations on local protein requirement (including men vs. women)
  - As a percentage of total calories:
    - Protein should provide 10-35% of total calories
  - As an absolute number (grams per day).
    - A healthy adult should consume 0.8 gram per kilogram of desirable body weight per day
      - Calculation:
        - » Weigh: 150 pounds = 68 Kg (150/2.2)
        - » Grams protein: 68 x 0.8 = 54g protein



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## RDA (AKG = Angka Kecukupan Gizi) Indonesia (Widya Karya Pangan & Gizi, 2004)

Age Group	Body Weight	Height	Energy (Kcal)	Protein (mg)	Vit. A (RE)	Thiamin (mg)	Riflavin (mg)	Niacin (mg)	Vit. B12 (ug)	Folic Acid (ug)	Vit.C (mg)	Calcium (mg)	Phosphor (mg)	Iron (mg)	Zink (mg)	
0-6 mts	5.5	60	550	12	350	0.3	3	2.5	0.1	22	30	600	200	3	3	
7-12 mts	8.5	71	650	15	350	0.4	0.4	3.8	0.1	32	35	400	250	5	5	
1-3 yrs	12	90	1000	23	350	0.5	0.6	5.4	0.5	40	40	500	250	8	10	
4-6 yrs	18	110	1550	32	360	0.7	0.9	7.6	0.7	60	45	500	350	9	10	
7-9 yrs	24	120	1800	37	406	0.7	0.9	8.1	0.9	81	45	500	400	10	10	
<b>Male</b>																
10-12 yrs	30	135	2050	45	450	0.8	1	8.6	1	90	50	700	500	14	15	
13-15 yrs	45	150	2400	69	600	0.9	1.1	9.7	1	125	60	700	500	17	15	
16-19 yrs	56	160	2500	66	600	1	1.2	10	1	165	60	600	500	23	15	
20-59 yrs	62	165	Mild 2800	55	600	1	1.2	10.6	1	170	60	500	500	13	15	
			Medium 3000	55	600	1.1	1.4	11.9	1	170	60	500	500	13	15	
			Heavy 3600	55	600	1.3	1.6	14.3	1	170	60	500	500	13	15	
60 yrs	62	165	2200	55	600	0.8	1	8.6	1	170	60	500	500	13	15	
<b>Female</b>																
10-12 yrs	35	140	1900	54	500	0.7	0.9	7.7	1	100	50	700	450	14	15	
13-15 yrs	46	153	2100	62	500	0.8	1	8.4	1	130	60	700	450	19	15	
16-19 yrs	50	153	2000	51	500	0.8	0.9	8.1	1	150	60	600	450	25	15	
20-59 yrs	54	156	Mild 2050	48	500	0.9	1	8.4	1	150	60	500	450	26	15	
			Medium 2250	48	500	0.9	1	9.3	1	150	60	500	450	26	15	
			Heavy 2600	48	500	1	1.2	10.6	1	150	60	500	450	26	15	
>60 yrs	54	154	1850	48	500	0.7	0.9	7.5	1	150	60	500	450	14	15	
+) pregnant				285	12	200	0.2	0.2	1.3	0.3	150	10	400	200	20	5
<b>+) breast feeding</b>																
0-6 mts			700	16	350	0.3	0.4	3.1	0.3	50	25	400	300	2	10	
7-12 mts			500	12	300	0.3	0.3	2.2	0.3	40	10	400	200	2	10	
13-24 mts			400	11	250	0.2	0.2	1.8	0.3	25	10	300	200	2	5	



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## RDA (AKG = Angka Kecukupan Gizi) Indonesia (Widya Karya Pangan & Gizi, 2004)

Age Group	Body Weight	Energy (Kcal)	Protein (mg)
0-6 months	5.5	560	12
7-12 months	8.5	800	15
1-3 years	12	1250	23
4-6 years	18	1750	32
7-9 years	24	1900	37



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**RDA (AKG = Angka Kecukupan Gizi)**  
**Indonesia** (*Widya Karya Pangan & Gizi, 2004*)

Age Group	Body Weight	Energy (Kcal )	Protein (mg)
Male			
10-12 years	30	2000	45
13-15 years	45	2400	69
16-19 years	56	2500	66
20-59 years	62	Mild 2800	55
		Medim 3000	55
		Heavy 3600	55
60 years	62	2200	55



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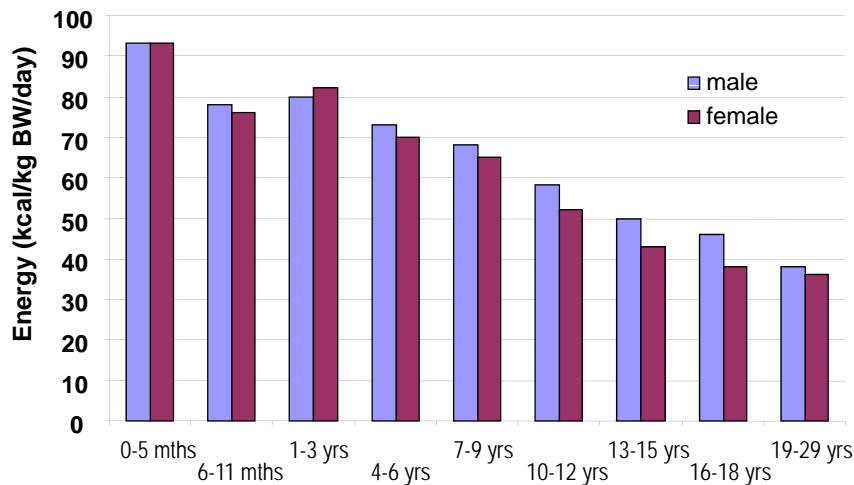
**RDA (AKG = Angka Kecukupan Gizi)**  
**Indonesia** (*Widya Karya Pangan & Gizi, 2004*)

Age Group	Body Weight	Energy (Kcal )	Protein (mg)
<b>Female</b>			
10-12 years	35	1900	54
13-15 years	46	2100	62
16-19 years	50	2000	51
20-59 years	54	Mild 2050	48
		Medium 2250	48
		Heavy 2600	48
>60 years	54	1850	48
<b>EXTRA?</b>			
(+) pregnant		285	12
(+) breast feeding			
0-6 months		700	16
7-12 months		500	12
13-24 months		400	11



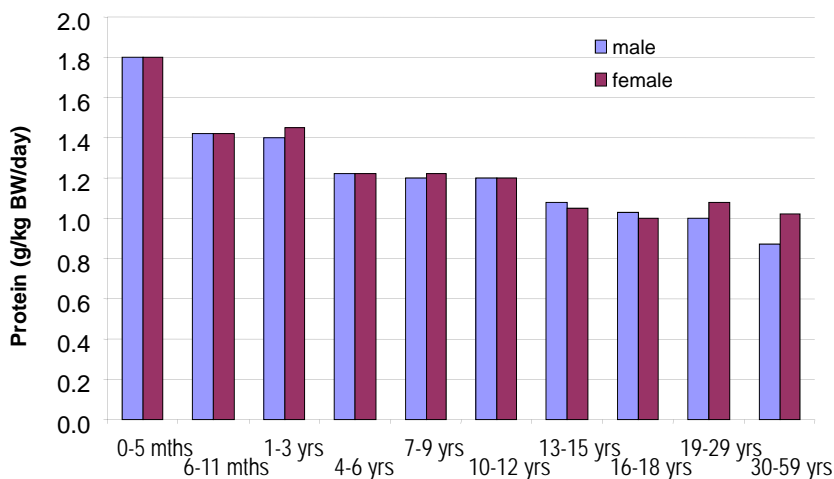
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# Importance and Role of Protein in the Indonesian Daily Diet

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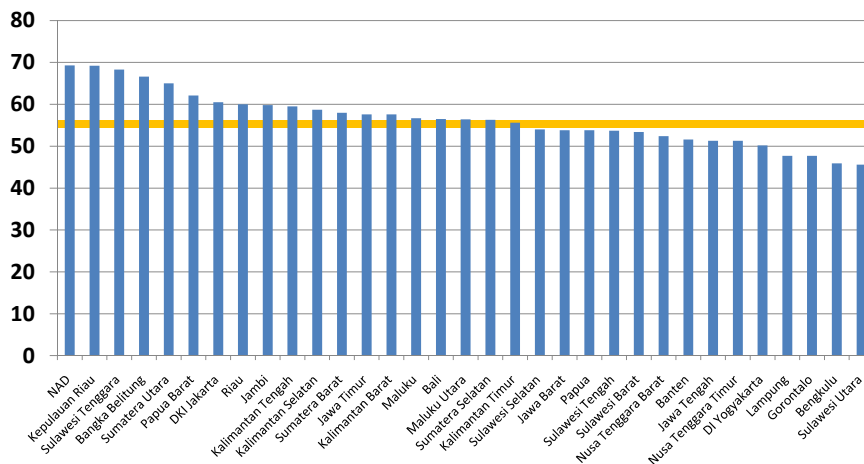
- **Overview of protein intake in Indonesia/Southeast Asian region**
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  - ✓ Sources and quality of protein
- **Opportunities for why protein in the local diet and health context**
  - ✓ Where can why protein play a role?
  - ✓ Advice on incorporating why protein into the daily diet

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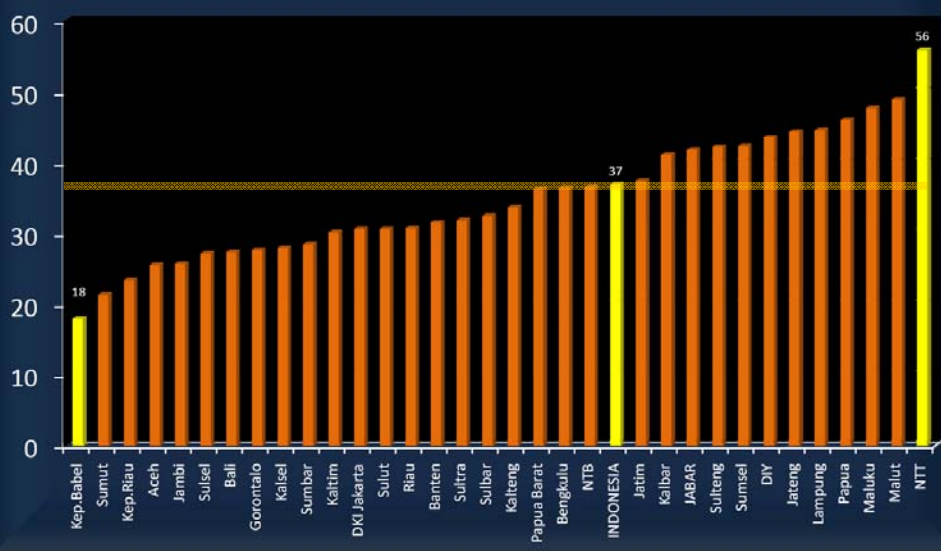
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Dietary Protein Consumption (g/person/day), **average**, based on Province in Indonesia (Riskesdas, 2007)



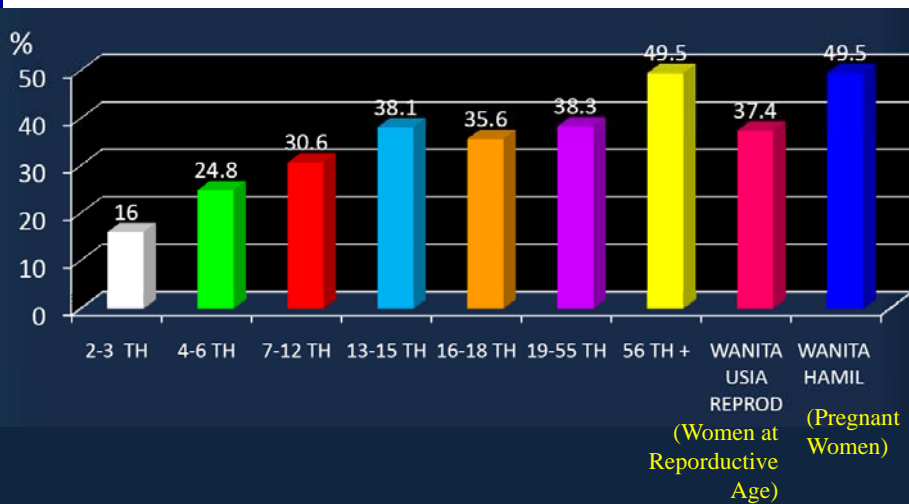
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**Percentage of population consuming protein < 80% RDA  
(Based on Provinces)**  
(Riskesdas, 2010)



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**Percentage of population consuming protein < 80% RDA  
(Based on Age Groups)**  
(Riskesdas, 2010)



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## Source of protein (g/capita.day; based on food groups); 1999, 2002 - 2009

No.	Food Groups	1999	2002	2003	2004	2005	2006	2007	2008	2009
1	Cereals	25,04	24,42	24,29	24,05	23,69	23,33	22,43	22,75	22,06
2	Roots/Tubers	0,43	0,43	0,44	0,53	0,45	0,41	0,4	0,42	0,33
3	Fish	6,07	7,17	7,91	7,65	8,02	7,49	7,77	7,94	7,28
4	Meat	1,33	2,26	2,62	2,54	2,61	1,95	2,62	2,4	2,22
5	Egg and Milk	1,43	2,33	2,22	2,38	2,71	2,51	3,23	3,05	2,96
6	vegetables	2,23	2,49	2,75	2,57	2,52	2,66	3,02	3,01	2,58
7	Nuts	4,81	6,36	5,85	5,52	6,31	5,88	6,51	5,49	5,19
8	Fruits	0,33	0,45	0,46	0,43	0,43	0,39	0,57	0,52	0,41
9	oils and fats	0,42	0,53	0,54	0,48	0,48	0,45	0,46	0,39	0,34
10	beverages	0,79	1,13	1,01	1,03	1,08	1	1,13	1,06	0,98
11	spices & condiments	0,66	0,79	0,69	0,71	0,82	0,81	0,76	0,73	0,68
12	Others	0,53	0,75	0,74	0,76	1,03	0,95	1,43	1,37	1,21
13	Processed Foods	4,62	5,34	5,84	6,01	6,44*)	5,83 *)	7,33 *)	8,36 *)	8,10 *)
14	Minuman beralkohol	0	0	0	0	-	-	-	-	-
15	Tembakau dan sirih	0	0	0	0	0	0	0	0	0
	<b>JUMLAH</b>	<b>48,67</b>	<b>54,45</b>	<b>55,37</b>	<b>54,65</b>	<b>55,27</b>	<b>53,65</b>	<b>57,66</b>	<b>57,49</b>	<b>54,35</b>

Sumber : Survei Sosial Ekonomi Nasional , Modul Konsumsi 1999, 2002 dan 2005 (2003, 2004 dan 2006 hanya mencakup panel 10.000 rumah tangga, sedangkan 2007, 2008 dan 2009 mencakup panel 68.800 rumah tangga)  
Catatan : \*) Termasuk minuman beralkohol



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### Source of protein (g/capita.day; based on food groups); 1999, 2002 - 2009

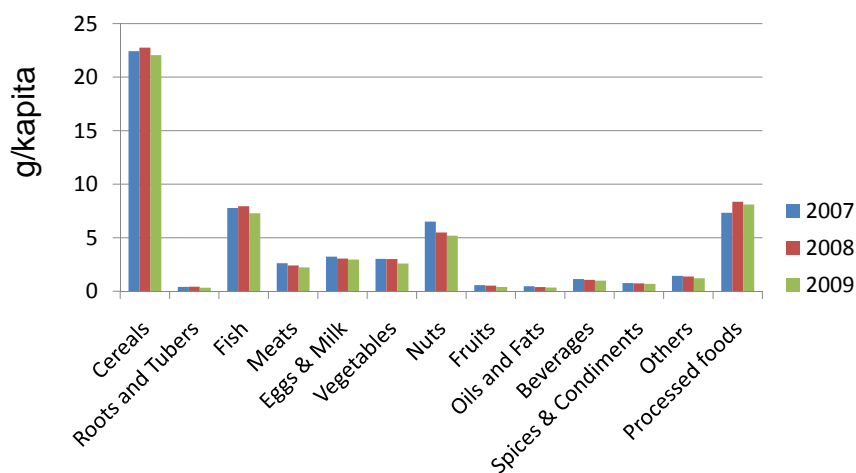
No.	Food Groups	2007	2008	2009
1	Cereals	22,43	22,75	22,06
2	Roots/Tubers	0,4	0,42	0,33
3	Fish	7,77	7,94	7,28
4	Meat	2,62	2,4	2,22
5	Egg and Milk	3,23	3,05	2,96
6	vegetables	3,02	3,01	2,58
7	Nuts	6,51	5,49	5,19
8	Fruits	0,57	0,52	0,41
9	oils and fats	0,46	0,39	0,34
10	beverages	1,13	1,06	0,98
11	spices & condiments	0,76	0,73	0,68
12	Others	1,43	1,37	1,21
13	Processed Foods	7,33 *)	8,36 *)	8,10 *)
<b>JUMLAH</b>		<b>57,66</b>	<b>57,49</b>	<b>54,35</b>

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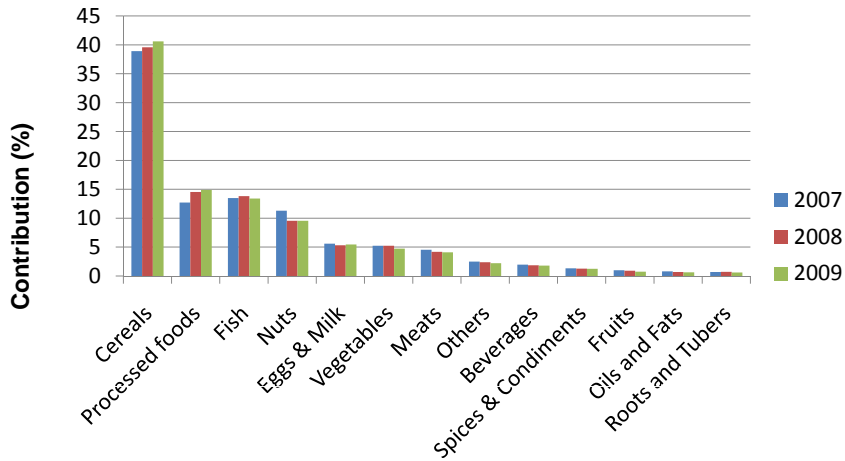


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### Contribution to protein consumption (%; based on food groups); 1999, 2002 - 2009

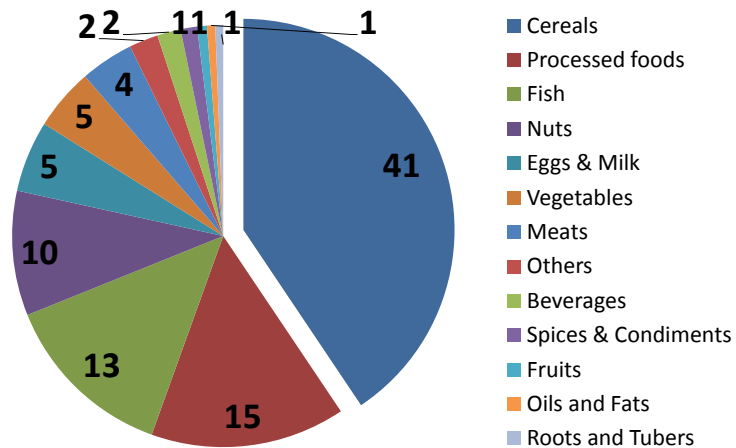


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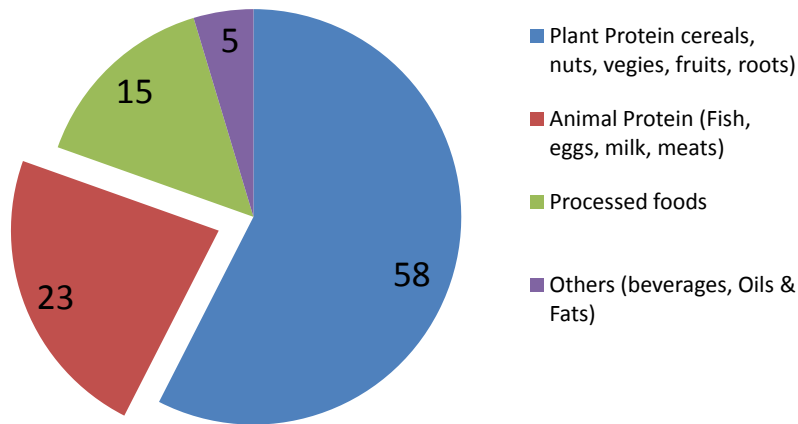


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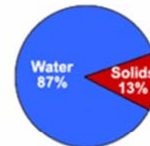
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## Where can whey protein play a role?

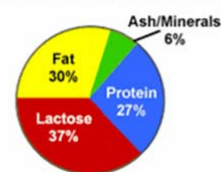
### Whey?

- Milk Protein
- High in sulfur containing amino acids
  - antioxidant
  - anticarcinogen
  - immune stimulating
- High concentrations of the branched chain amino acids - muscles

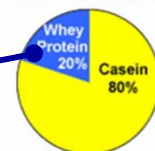
#### Composition of Whole Milk



#### Composition of Milk Solids



#### Composition of Milk Protein



<http://www.wheyoflife.org/faq.cfm#1>

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## Where can whey protein play a role?

### Reported Whey Benefits

- Cardiovascular benefits (antihypertensive and hypocholesteremic)
  - Anticarcinogenic effects
  - Antibacterial and antiviral properties
  - Antioxidant actions
  - Immune system stimulation
  - Improved bone formation/reduced bone loss
  - Increased mineral absorption
  - Reduction of tooth enamel demineralization and plaque formation
  - Appetite suppression
  - Rebuilding of muscle tissue
- 
- Will be discussed by next presenter

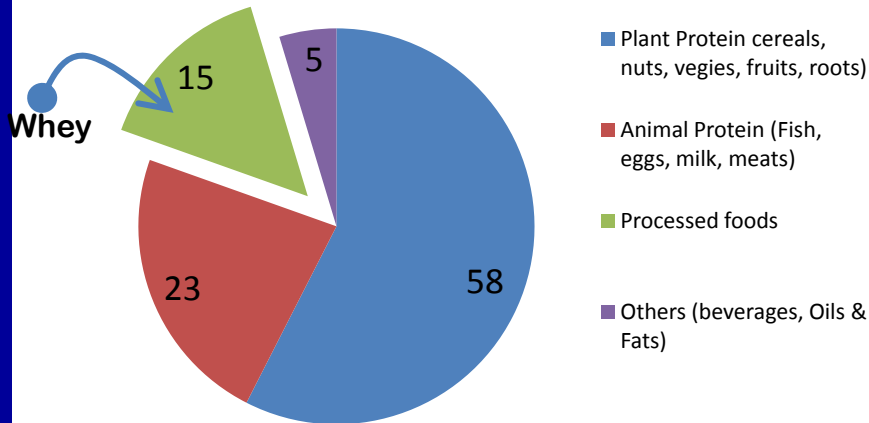
Ingredients,  
With  
functionality

↓  
Processed  
Foods  
?



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## Where can whey protein play a role?



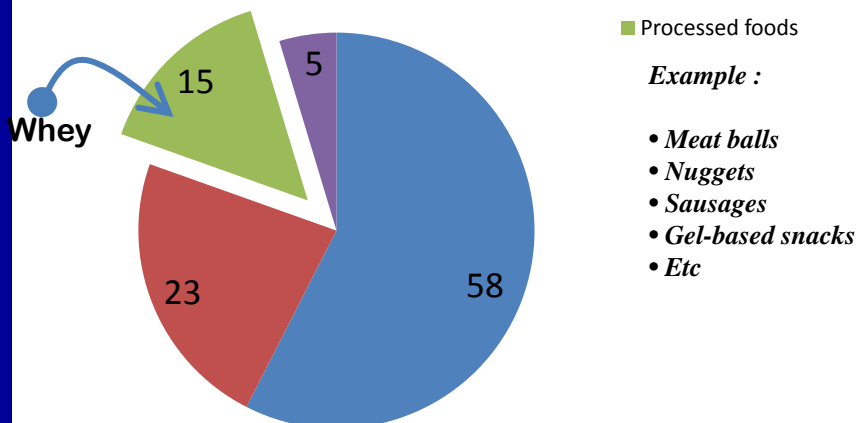
### Contribution to protein consumption (%; based on food groups); 1999, 2002 - 2009

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## Where can whey protein play a role?



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## Advice on incorporating whey protein into the daily diet

Economic Consideration	2005	2006	2007	2008	2009
- Percentage of household spending for foods	51,37	53,01	49,24	50,17	50,62
- Percentage of household spending for non-foods	48,63	46,99	50,76	49,83	49,38

Food Groups	2005	2006	2007	2008	2009
- Cereals	8,54	11,37	10,15	9,57	8,86
- Roots/Tubers	0,58	0,59	0,56	0,53	0,51
- Fish	4,66	4,72	3,91	3,96	4,29
- Meat	2,44	1,85	1,95	1,84	1,89
- Egg and Milk	3,12	2,96	2,97	3,12	3,27
- vegetables	4,05	4,42	3,87	4,02	3,91
- Nuts	1,7	1,63	1,47	1,55	1,57
- Fruits	2,16	2,1	2,56	2,27	2,05
- oils and fats	1,93	1,97	1,69	2,16	1,96
- beverages	2,23	2,5	2,21	2,13	2,02
- spices & condiments	1,33	1,37	1,1	1,12	1,08
- Others	1,34	1,27	1,34	1,39	1,33
- Processed Foods	11,44	10,29	10,48	11,44	12,63

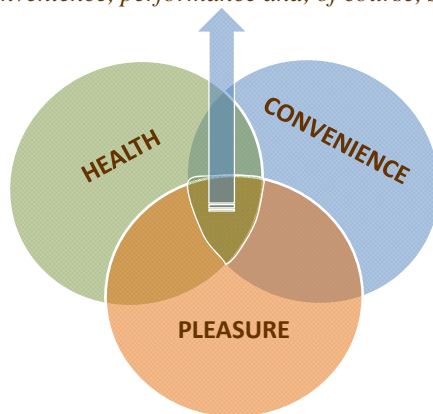


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## Advice on incorporating whey protein into the daily diet

Consumers expectations for **functional foods**:  
functionality, convenience, performance and, of course, **superior taste**

- More information
- More evidence for claim
- More control over “food plus”, “food minus”, and “natural alternative”



- More individual (portion control)
- More control over time and quality of preparation

- More fun & entertaining
- More ethnic & exotic taste
- More premium & indulgents



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## Advice on incorporating whey protein into the daily diet

Consumers expectations for **functional foods**:

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### Foods that function

- Protection against...
- Heart Disease
- Cancer
  
- ↑Cognitive Function
- ↑ Digestion
- ↑ Bone Strength



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## Advice on incorporating whey protein into the daily diet

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### Convenient Foods :

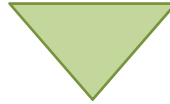
- Fast and Simple
- “Take Out”
- Healthy
- Frozen Foods
- Restaurants
- Healthcare



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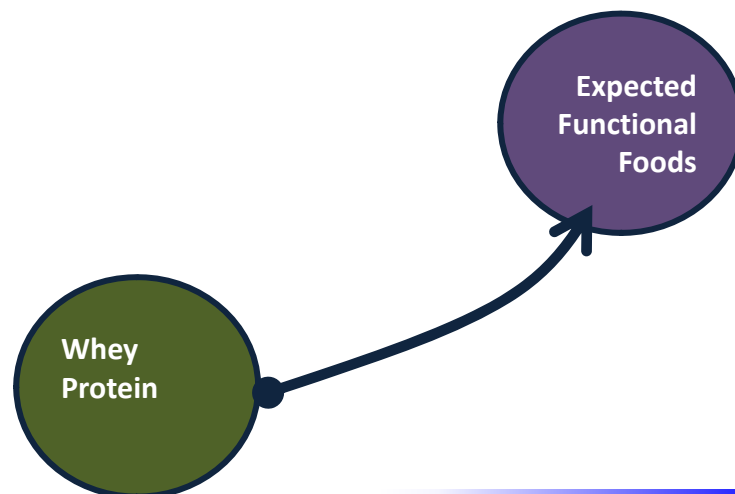


**Foods that perform :**  
**→ Super foods?**

- Foods with health benefits
- 2 for 1
- Omega-3 Fatty Acids
- Antioxidants
- Probiotics

## Advice on incorporating whey protein into the daily diet

Consumers expectations for **functional foods**:  
functionality, convenience, performance and, of course, **superior taste**



**Terimakasih**  
*Thank You*

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