Importance and Role of Protein in the Indonesian Daily Diet

Purwiyatno Hariyadi**

1) Presented at “Whey Protein Health and Fitness Seminar”, Jakarta, 13 July, 2011

2) Director of Southeast Asian Food & Agricultural Science & Technology (SEAFAST) Center, and Professor of Food Process Engineering, Department of Food Science and Technology, Faculty of Agricultural Engineering and Technology, Bogor Agricultural University

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
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*

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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
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?

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

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Importance and Role of Protein in the Indonesian Daily Diet

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

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

*) 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%
Importance and Role of Protein in the Indonesian Daily Diet

- 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

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
### Importance and Role of Protein in the Indonesian Daily Diet

**RDA (AKG = Angka Kecukupan Gizi)**

*Indonesia (Widya Karya Pangan & Gizi, 2004)*

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Body Weight</th>
<th>Energy (Kcal)</th>
<th>Protein (mg)</th>
<th>Vit. A (RE)</th>
<th>Thiamin (mg)</th>
<th>Riboflavin (mg)</th>
<th>Niacin (mg)</th>
<th>Vit. B12 (ug)</th>
<th>Folic Acid (mg)</th>
<th>Vit. C (mg)</th>
<th>Calcium (mg)</th>
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**Male**

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**SEAFAST Center**

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hariyadi@seafast.org

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*Importance and Role of Protein in the Indonesian Daily Diet – purwiyatno hariyadi*
## RDA (AKG = Angka Kecukupan Gizi) Indonesia (Widya Karya Pangan & Gizi, 2004)

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<td>Mild 2800</td>
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**EXTRA?**

- (+) pregnant 285 12
- (+) breast feeding
  - 0-6 months 700 16
  - 7-12 months 500 12
  - 13-24 months 400 11
Importance and Role of Protein in the Indonesian Daily Diet

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

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Protein (g/kg BW/day)

- 0-5 mths: 1.6
- 6-11 mths: 1.4
- 1-3 yrs: 1.2
- 4-6 yrs: 1.0
- 7-9 yrs: 0.8
- 10-12 yrs: 0.6
- 13-15 yrs: 0.4
- 16-18 yrs: 0.2
- 19-29 yrs: 0.0
- 30-59 yrs: 0.0

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Energy (kcal/kg BW/day)

- Male:
  - 0-5 mths: 100
  - 6-11 mths: 90
  - 1-3 yrs: 80
  - 4-6 yrs: 70
  - 7-9 yrs: 60
  - 10-12 yrs: 50
  - 13-15 yrs: 40
  - 16-18 yrs: 30
  - 19-29 yrs: 20
- Female:
  - 0-5 mths: 100
  - 6-11 mths: 90
  - 1-3 yrs: 80
  - 4-6 yrs: 70
  - 7-9 yrs: 60
  - 10-12 yrs: 50
  - 13-15 yrs: 40
  - 16-18 yrs: 30
  - 19-29 yrs: 20

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Importance and Role of Protein in the Indonesian Daily Diet -- purwiyatno hariyadi
Importance and Role of Protein in the Indonesian Daily Diet

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  - 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

Dietary Protein Consumption (g/person/day), average, based on Province in Indonesia (Riskesdas, 2007)
Percentage of population consuming protein < 80% RDA
(Based on Provinces) (Riskesdas, 2010)

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

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## Importance and Role of Protein in the Indonesian Daily Diet

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

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<th>No.</th>
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<td>57.66</td>
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Catatan: *) Termasuk minuman beralkohol

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Catatan: *) Termasuk minuman beralkohol
Importance and Role of Protein in the Indonesian Daily Diet

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

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

Catatan: *) Termasuk minuman beralkohol
Importance and Role of Protein in the Indonesian Daily Diet

- 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

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

- Plant Protein (cereals, nuts, veges, fruits, roots): 15%
- Animal Protein (fish, eggs, milk, meats): 23%
- Processed foods: 58%
- Others (beverages, Oils & Fats): 5%

Catatan: *) Termasuk minuman beralkohol

Sumber: Purwiyatno Hariyadi, hariyadi@seafast.org
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

Where can whey protein play a role?

Reported Whey Benefits

- Cardiovascular benefits (antihypertensive and hypocholesteremic)
- Anticarcenogenic 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

?-
Importance and Role of Protein in the Indonesian Daily Diet

Where can whey protein play a role?

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


Catatan: *) Termasuk minuman beralkohol

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


Catatan: *) Termasuk minuman beralkohol
Advice on incorporating whey protein into the daily diet

Economic Consideration

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Food Groups

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<th>Meat</th>
<th>Egg and Milk</th>
<th>Vegetables</th>
<th>Nuts</th>
<th>Oils and fats</th>
<th>Beverages</th>
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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 & indulgences
Importance and Role of Protein in the Indonesian Daily Diet

Advice on incorporating whey protein into the daily diet

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

Foods that function

• Protection against…
• Heart Disease
• Cancer
• ↑Cognitive Function
• ↑Digestion
• ↑Bone Strength

Convenient Foods:

• Fast and Simple
• “Take Out”
• Healthy
• Frozen Foods
• Restaurants
• Healthcare
Advice on incorporating whey protein into the daily diet

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

Foods that perform:
→ Super foods?

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

hariyadi@seafast.org