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**GIZI KEBUGARAN  
PERTEMUAN X  
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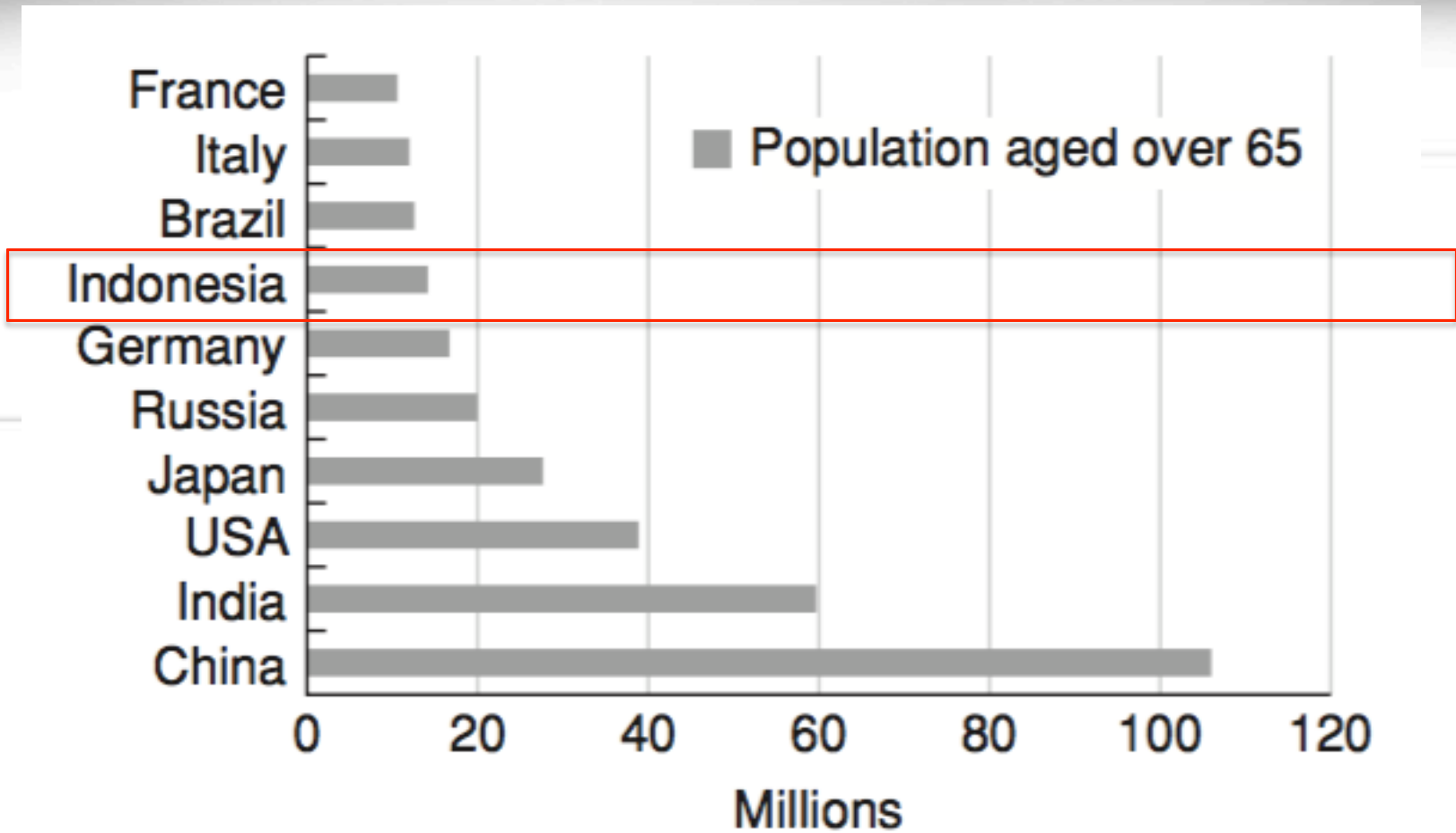


# THE AGING ATHLETE

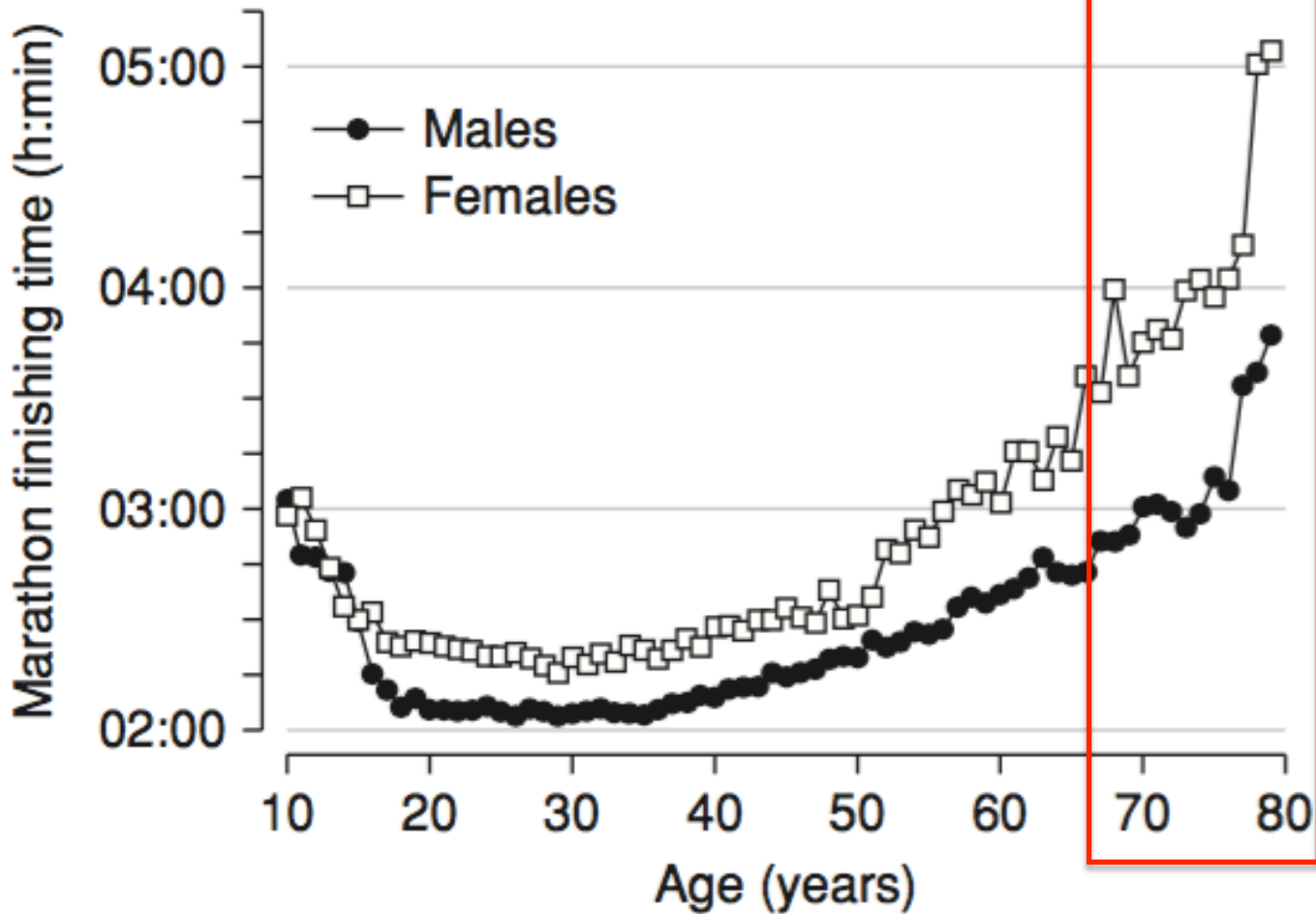
# Objective

To overview of the physiological benefits of sport to the aging individual, discusses **nutrition recommendations** for the aging athlete, and highlights special nutrition concerns including hydration, nutrient–medication interactions, and dietary supplements.





Rank order of the world's 10 largest older populations: 2008 (in millions) rank country population aged 65 and over. From US Census Bureau, International Data Base, accessed on October 2, 2011.



World male and female single age recordsmarathon. [http://www.arrs.net/SA\\_Mara.htm](http://www.arrs.net/SA_Mara.htm)

# **SPORTS PARTICIPATION AND EFFECTS ON PHYSIOLOGICAL SYSTEMS**

# Cardiorespiratory Function and Cardiovascular Disease Risk

- Aging athletes who continue to perform endurance type activities retain **greater aerobic capacity** than sedentary age matched controls.
- Research on masters runners has shown that peak endurance is maintained until about the age of 35 years and then modest declines are seen until the fifth and sixth decade with more severe decreases in performance after the age of 60.

Studying participants over the age of 50 competing in the 2001 National Senior Olympic Games, found a 3.4% decrease in performance per year over 35 years of competition in both male and female athletes (50–75 years)





# Muscle Function

Whereas VO<sub>2</sub> max starts to decline in the early fourth decade, age-related muscle atrophy usually begins at about age 50 when a loss of both muscle mass and strength of about 10–15% per decade



# Bone Mineral Density

- Master athletes tend to have better bone health, both greater bone mineral density and bone mineral content compared to **sedentary individuals**, probably related to the mechanical stress on bone through exercise.
- Male athletes had 14% larger tibias and female athletes 26% larger tibias compared to controls; there was also about 4% increase in cortical bone in the athletes.
- The researchers found that total body bone mineral density of runners was significantly greater than controls and marginally improved in the swimmers, suggesting that impact sports have a greater positive effect on bone than non-impact sports.

# Emerging Health Benefit of Exercise

- Aging athletes have lower cardiovascular disease risk, improved ability to maintain skeletal muscle, better bone architecture and mass, and less risk of obesity and diabetes
- Masters athletes had greater white matter integrity in areas of the brain related to motor control and working memory, suggesting that these functions are better preserved in aging athletes.

## Macronutrient recommendations for aging athletes

Carbohydrate	Protein	Fat
3–5 g/kg/day for low intensity or light training	1.0–1.7 g/kg/day with protein at the higher end when energy intake is restricted or a strength training program is in the initial stages	20–35% of total energy
5–7 g/kg/day for moderate training of 1 h/day		Linoleic acid 17 g/day for men and 12 g/day for women
6–10 g/kg/day for moderate intensity training of 1–3 h/day		Alpha-linoleic acid 1.6 g/day for men and 1.1 g/day for women
8–12 g/kg/day for ultraendurance training at high intensity for 3–4 h/day		

Source: Burke et al. (2011), Rodriguez, et al. (2009), Tarnopolsky (2008), IOM (2002).

# Nutritional Considerations for Aging Athletes

- Energy Needs
- Carbohydrate Needs
- Protein Needs
- Micronutrients



# TERIMA KASIH