



# Cholesterol intake



# Cholesterol



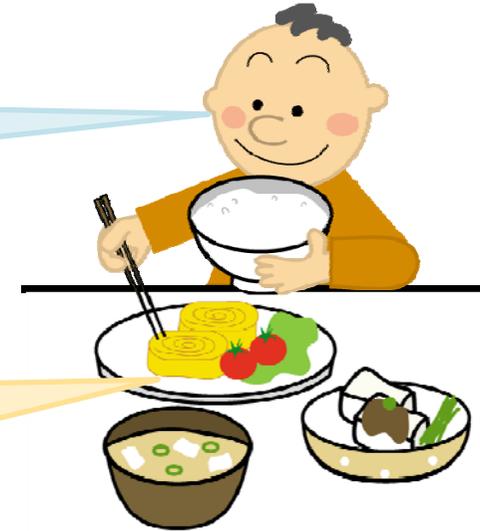
- Cholesterol is a structural component of animal cell membranes and a precursor of hormones.
- Cholesterol is divided into blood cholesterol, which is synthesized in the body, and dietary cholesterol.

**Blood total cholesterol  $\neq$  Dietary cholesterol**

# Origins of blood total cholesterol

**80%** is synthesized in the body

**20%** is derived from the diet



Approximately 80% of blood total cholesterol is synthesized in the body (mainly in the liver). Its concentration is 12-13 mg/kg body weight/d (i.e., 600-650 mg/d for a person weighing 50 kg).

## Reference

- Bile Acids: Physiology and metabolism. New York : Plenum Press , 1973. Padmanabhan P. Nair, David Kritchevsky.
- [http://www.health-net.or.jp/tairyoku\\_up/chishiki/cholesterol/t03\\_02\\_04\\_01.html](http://www.health-net.or.jp/tairyoku_up/chishiki/cholesterol/t03_02_04_01.html). Japan Health Promotion and Fitness Foundation.
- Journal of Lipid Research, Vol 41, 2000 Comparison of deuterium incorporation and mass isotopomer distribution analysis for measurement of human cholesterol biosynthesis.

# Blood cholesterol



Blood cholesterol is divided by its function into **low-density lipoprotein (LDL) cholesterol** and **high-density lipoprotein (HDL) cholesterol**.

High LDL-cholesterol density and low HDL-cholesterol density promote plaque deposition on the arterial walls and lead to dyslipidemia. These conditions may promote arterial sclerosis and thus lead to cerebral infarction, ischemic heart disease, renal dysfunction, and/or cirrhosis.

## Reference

- J Atheroscler Thromb. 2011;18(6), Association between non-high-density lipoprotein cholesterol levels and the incidence of coronary heart disease among Japanese: the Circulatory Risk in Communities Study (CIRCS).
- Circulation. 1994 Jun;89(6), High-density lipoprotein cholesterol and premature coronary heart disease in urban Japanese men.

# Association between dietary cholesterol and body cholesterol

- If dietary cholesterol intake **increases**, cholesterol synthesis in the liver will **decrease**.
- If dietary cholesterol intake **decreases**, cholesterol synthesis in the liver will **increase**.

Feedback systems keep peripheral levels constant.



In healthy individuals, blood total cholesterol density does not directly reflect dietary cholesterol intake.

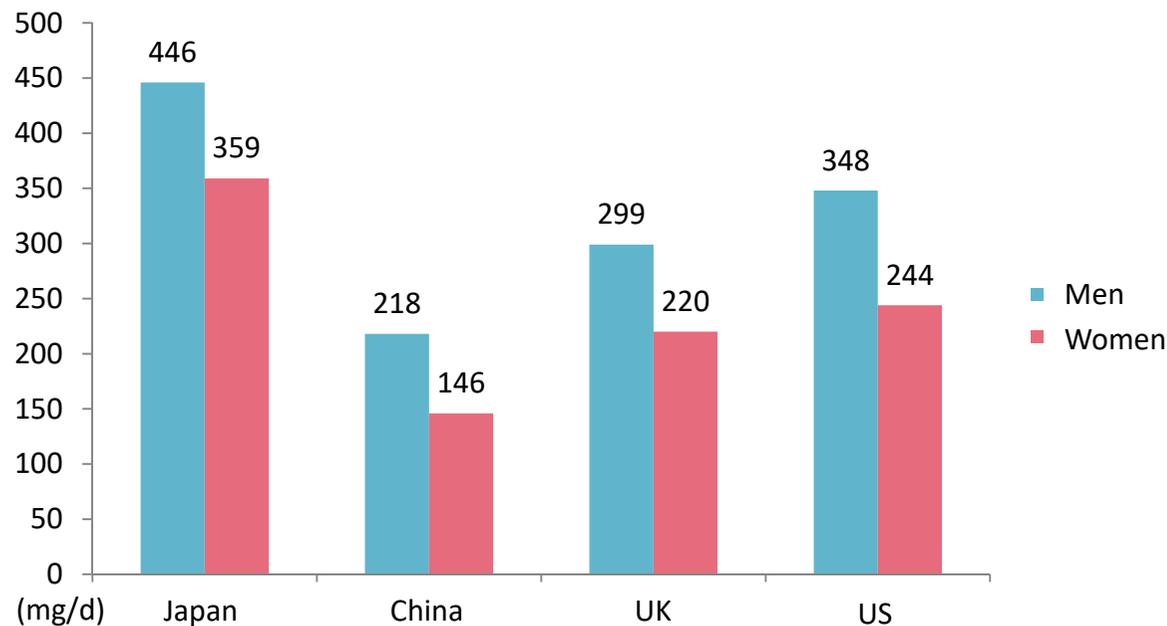
## Reference

- Ministry of Health, Labour and Welfare, Japan. Dietary Reference Intakes for Japanese, 2020. 2019.
- J Clin Invest. 1987 Jun;79(6):1729-39. Heterogeneity of cholesterol homeostasis in man. Response to changes in dietary fat quality and cholesterol quantity.

# Dietary cholesterol intake

Japanese have a relatively higher dietary cholesterol intake than other countries

## Comparison of dietary cholesterol intake across the four countries



### Reference

- Journal of Human Hypertension (2003) 17, 623–630. Nutrient intakes of middle-aged men and women in China, Japan, United Kingdom, and United States in the late 1990s: The INTERMAP Study.

# Dietary Reference Intakes for Japanese for dietary cholesterol intake

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- Dietary Reference Intakes for Japanese, 2020 set recommendations for dietary cholesterol intake.

It is difficult to set the dietary goal for dietary cholesterol because cholesterol is synthesized in the body. For the prevention of the onset of dyslipidemia and cardiovascular diseases, however, any recommendations should be set to prevent excessive intake from diet. To prevent the progress of dyslipidemia, no more than 200 mg/d should be consumed.

## Reference

- Ministry of Health, Labour and Welfare, Japan. Dietary Reference Intakes for Japanese, 2020. 2019.