Creating a Menu of Change Healthy Food in Health Care

By

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Chair, Task Force on HPH & Environment,

The International Health Promoting Hospitals and Health Services Network

尊重生命 人本醫療

Summary

1. **Planet Earth**: **Climate change, extreme weather, sustainability, biodiversity, food security**

2. **Health**: **Chronic diseases prevention, health promotion**

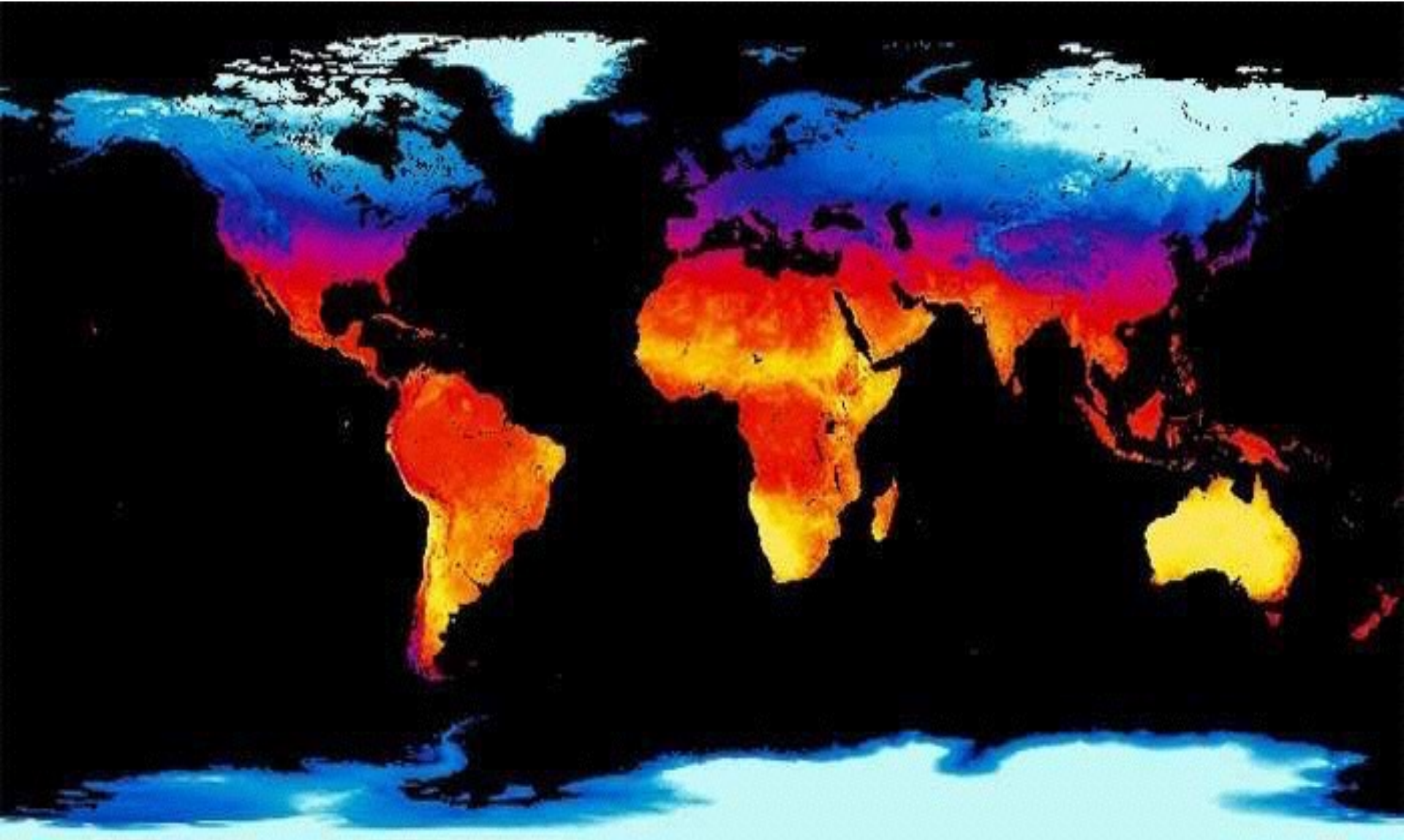3. **Hospital**: **Physical, spiritual and mental health, health education**
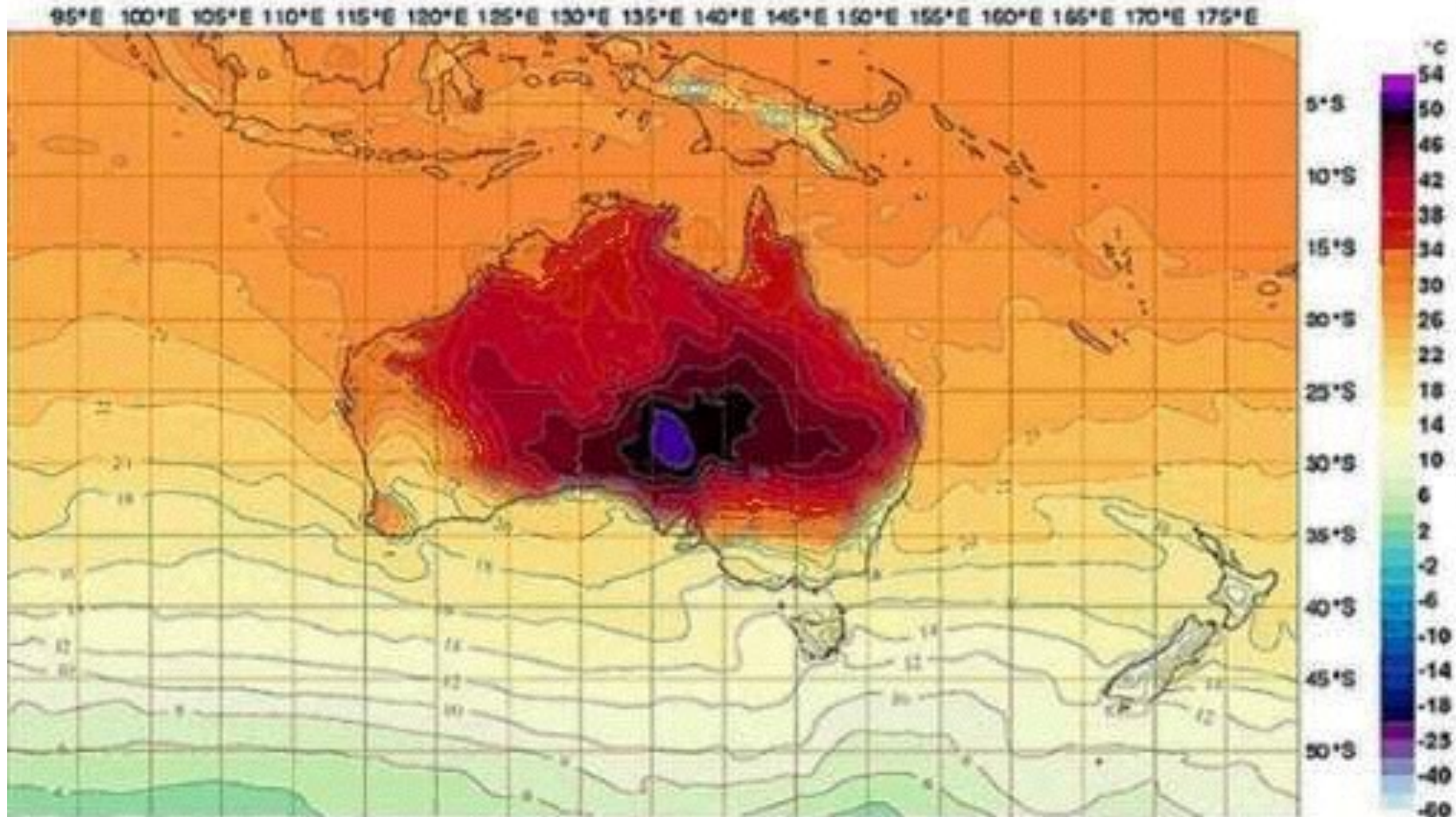
Planet Earth Is sick,

Running a temperature

Hottest day on record

Australia record 54 C, can be seen from satellite

Brush fire in California, July, 2015

Threatens housing

智利:瓦巴萊索港口發生森林大火，已燒毀500棟民宅。

Photo by Rick McClure

Multiple cars caught fire after a brush fire started on the I-15 near San Bernardino July 17, 2015

Trucks caught fire
Several cars caught on fire

KCAL/KCBS

IPCC - Intergovernmental Panel on Climate Change

The opening session of IPCC meeting in Yokohama, March, 2014
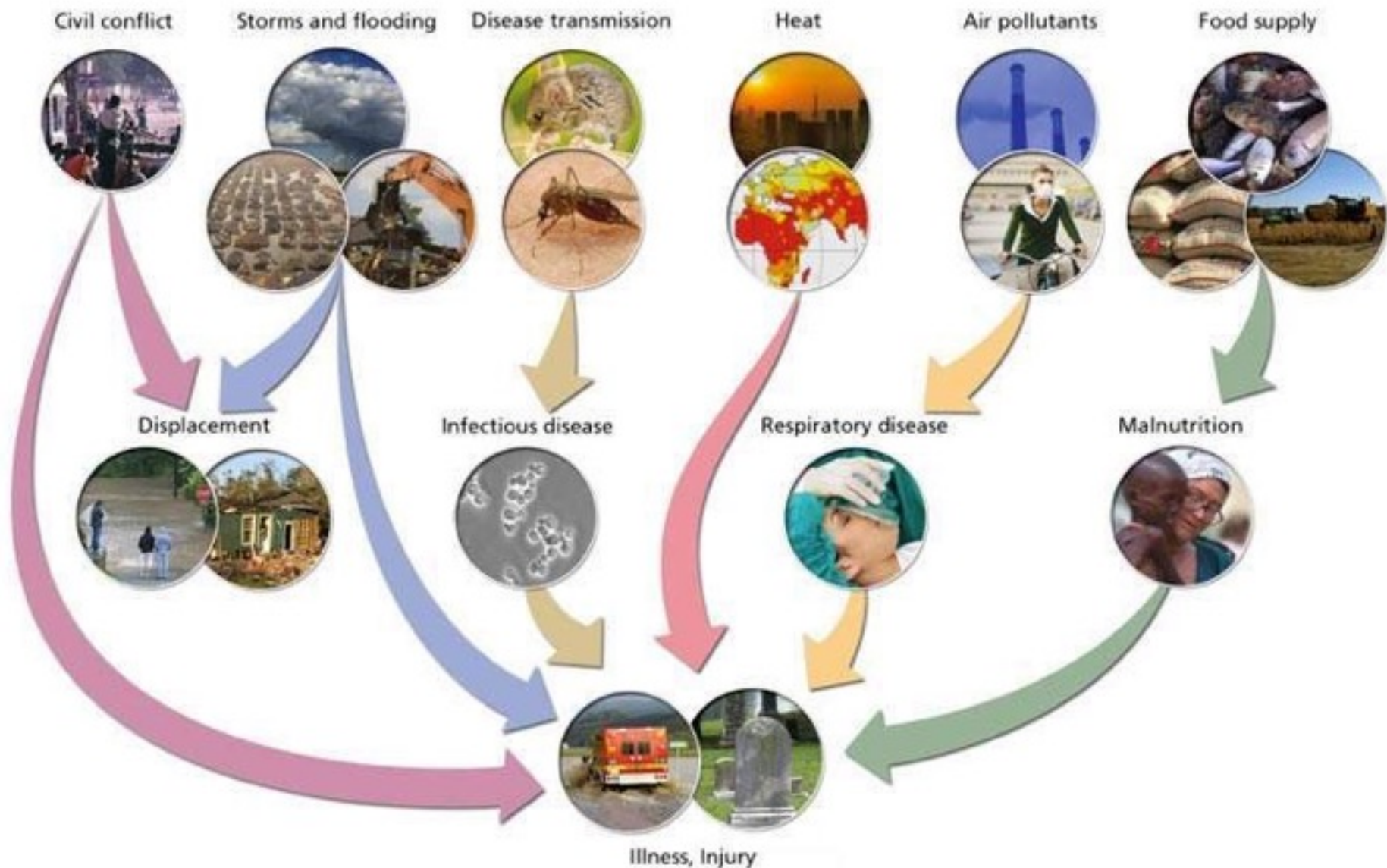
HEALTH THREATS

Climate Change and Health
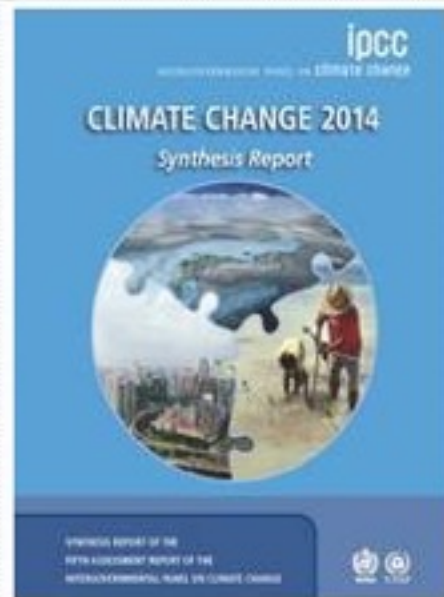
"Climate Change is the biggest global health threat of the 21st century"[1]

Climate Change Effects on Human Health
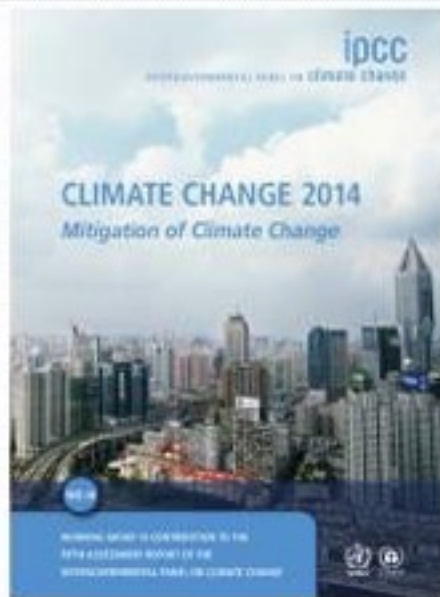
INCREASING MAGNITUDES
OF WARMING INCREASE
THE LIKELIHOOD OF

**SEVERE AND
PERVASIVE IMPACTS**

ipcc
INTERGOVERNMENTAL PANEL ON climate change

Extreme Weather
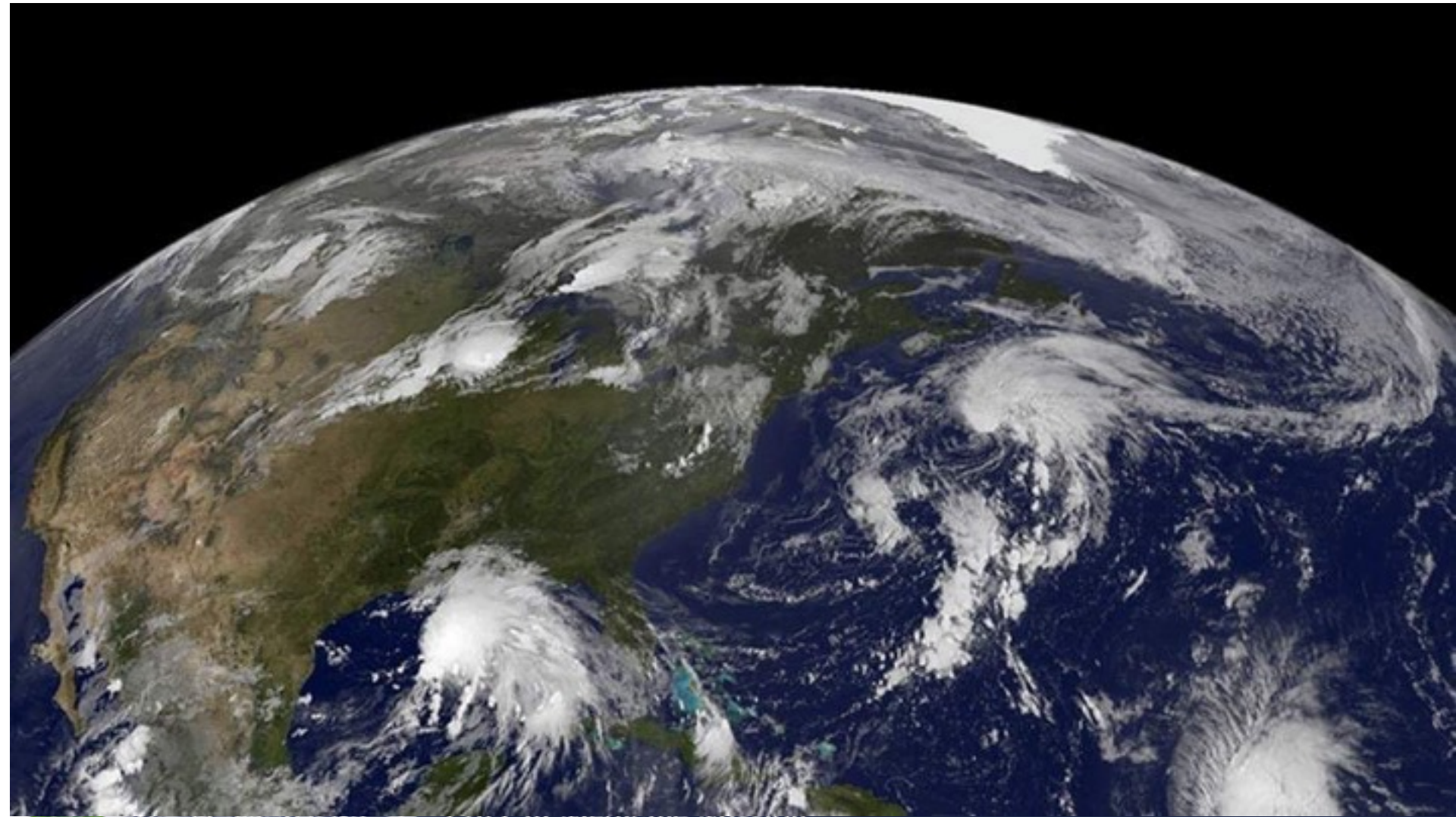
Min Temperature (C)
01/28/2014
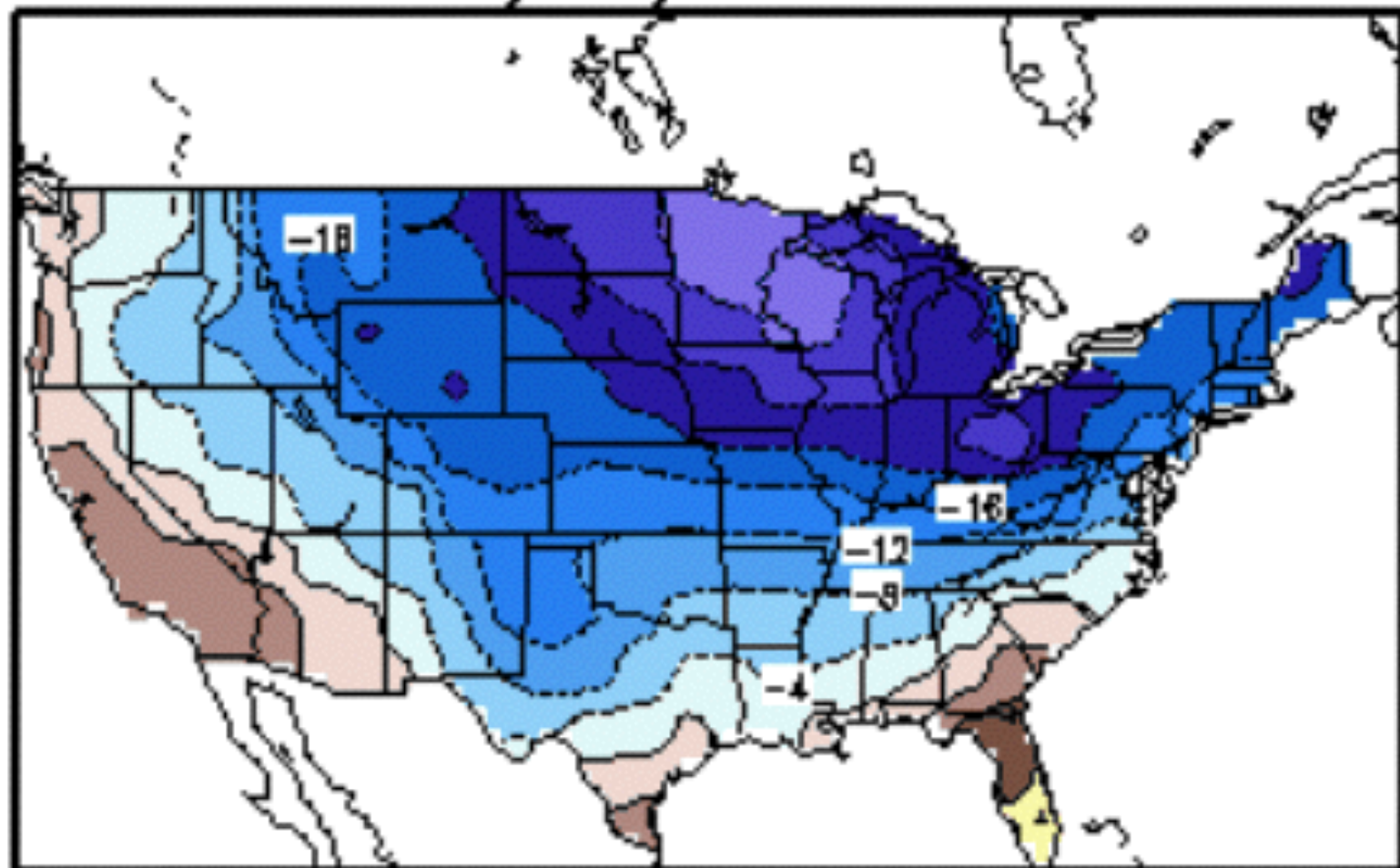
中國："北極渦漩"影響，[內蒙古]零下46度"極寒天氣"，"冰霧瀰漫"能見度低

挪威小島[羅文德] 海岸邊-有'魚群'被急凍在冰層中

Swarms of locusts invade southern Russia -CNN

They eat everything in sight

北京地下水枯竭。

北京地陷造成的境洞。

IPCC Report

CO₂ concentration, temperature, and sea level continue to rise long after emissions are reduced
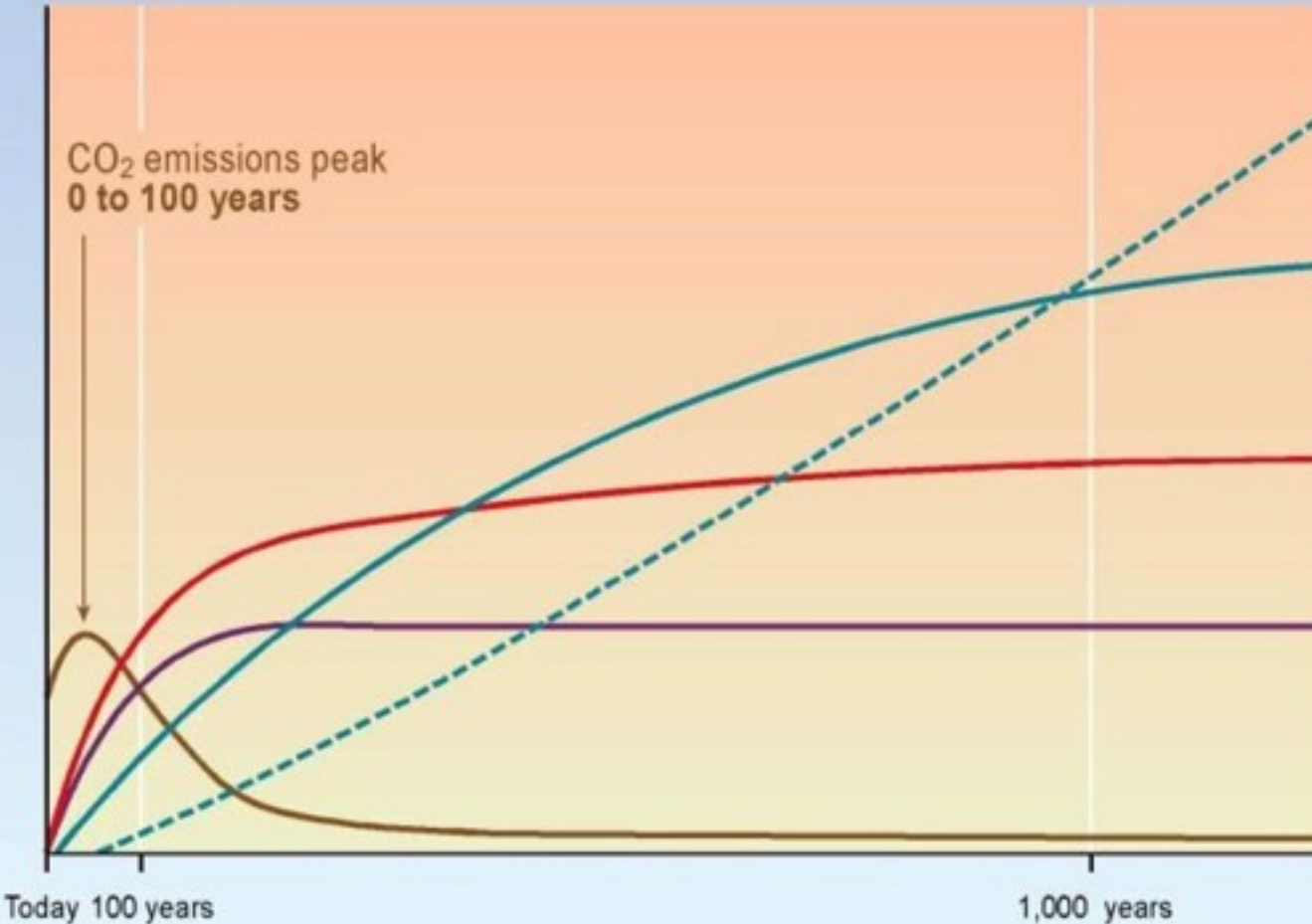
Climate Change

If we don't do anything about it!
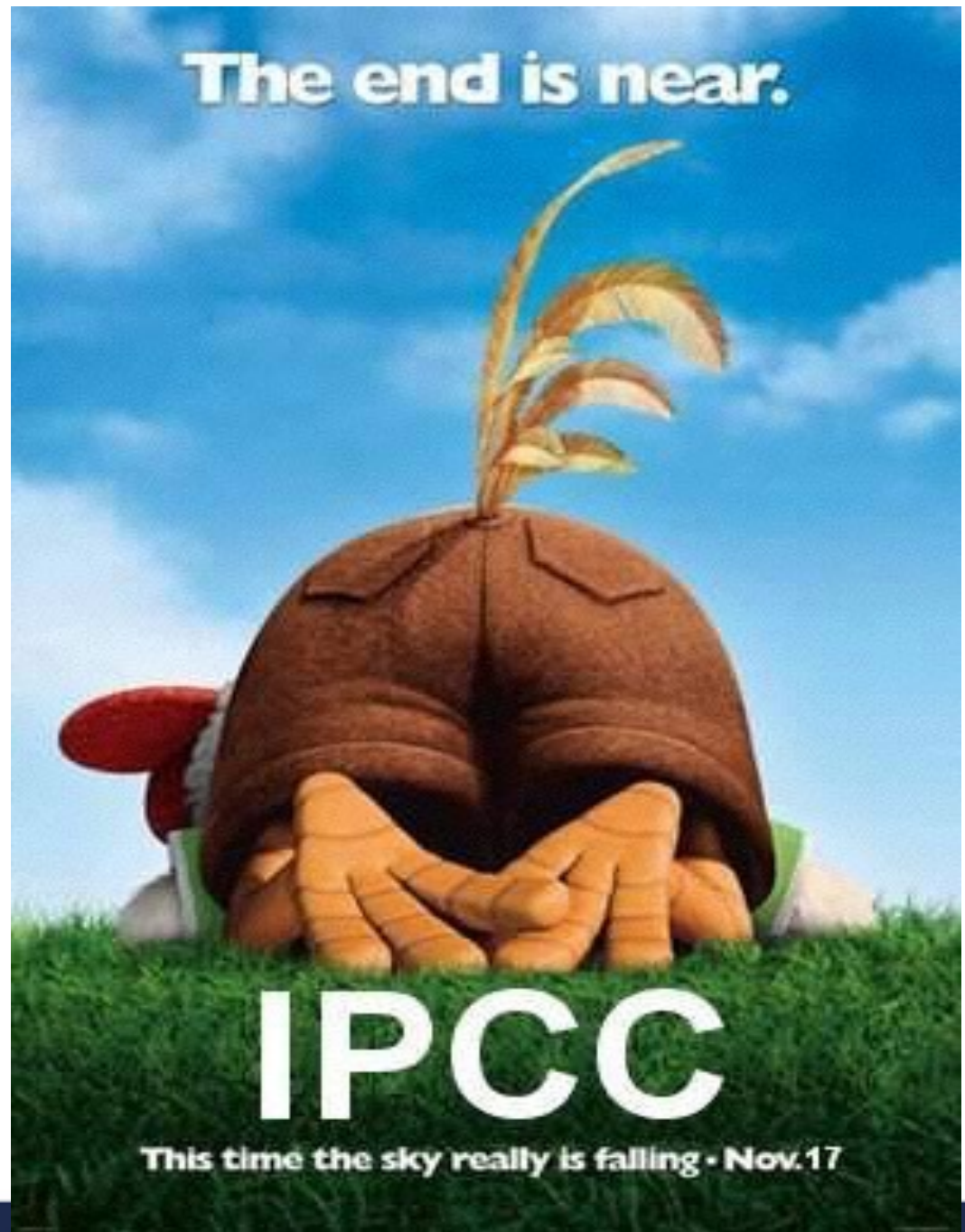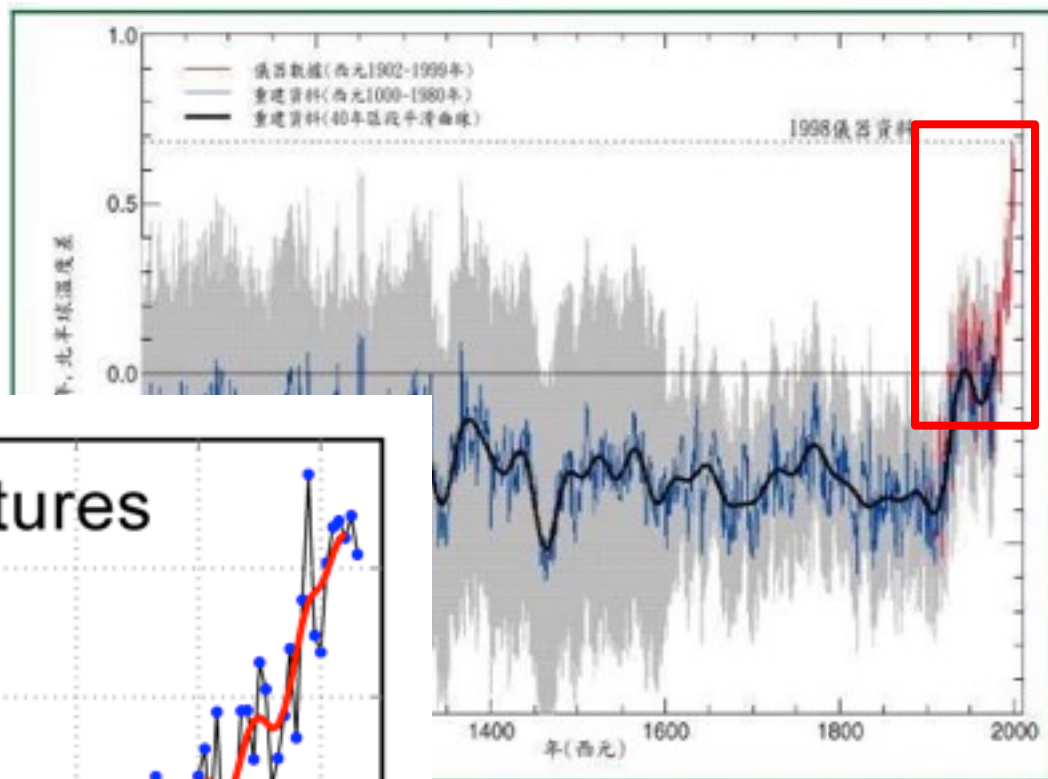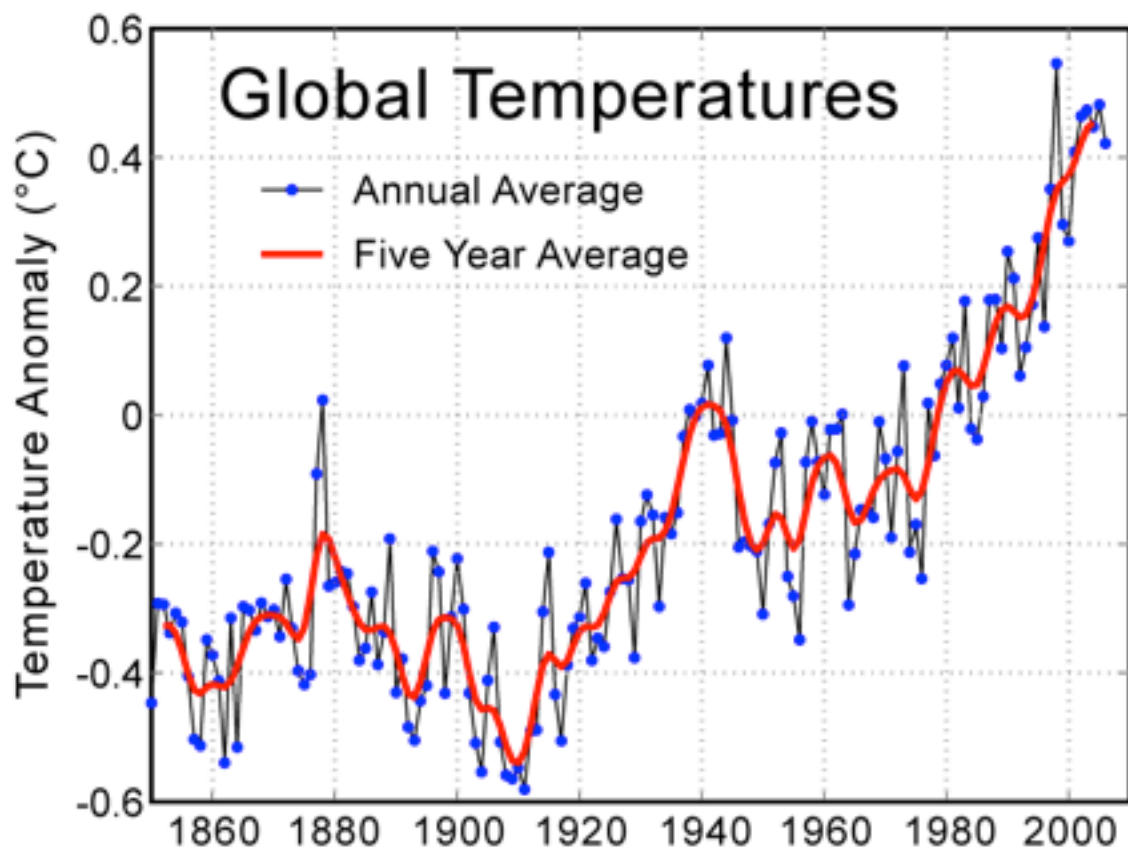
U.S. Drought Monitor

July 31, 2012
Valid 7 a.m. EDT
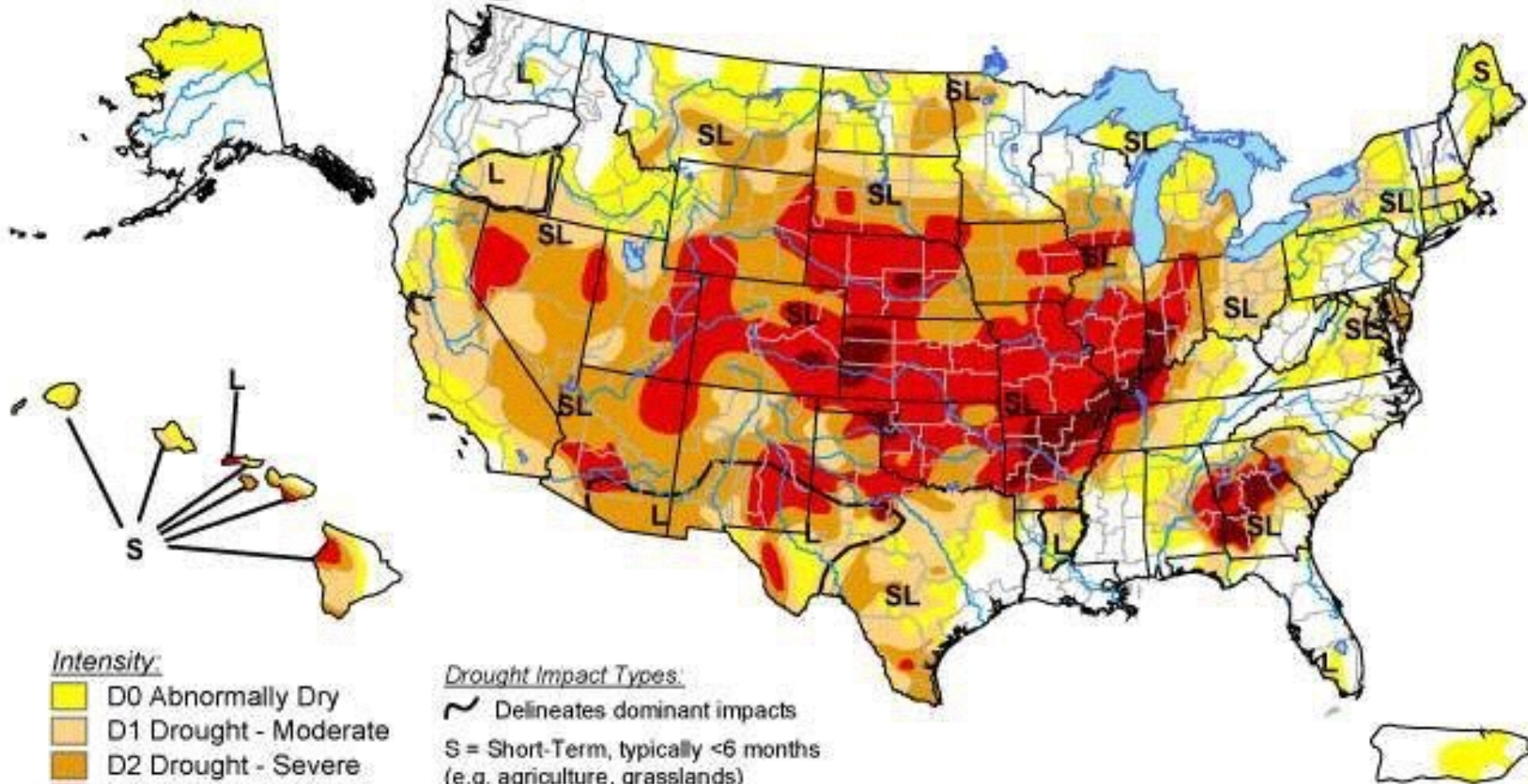
Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:

~ Delineates dominant impacts

S = Short-Term, typically <6 months (e.g. agriculture, grasslands)

L = Long-Term, typically >6 months (e.g. hydrology, ecology)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://droughtmonitor.unl.edu/

USDA · National Drought Mitigation Center

Released Thursday, August 2, 2012
Author: Mark Svoboda, National Drought Mitigation Center

A bull grazes on dry wheat husks in Logan, Kansas, hit by the record drought

Drought - more frequent and severe

慈濟醫療志業 Tzu Chi Medicine Mission

Both East and the Horn of Africa have been hit by the worst drought in 60 years,

Hawaii's Kilauea volcano erupts with greater fury

Why should hospitals participate ?

1. **Hospital uses a lot of natural resources**
2. **The Hospital produces lots of potentially dangerous waste**
3. **Large number of people pass through**

Definition of Health

The World Health Organization defined health as:

A state of complete physical, mental and social well-being, rather than solely as absence of disease. (WHO Constitution,1946)

Definition of Health Promotion

The World Health Organization defined health promotion as:

The process of enabling people to increase control over their health and it's determinants, and thereby improve their health. **(WHO Bangkok Charter for health Promotion in a Globalized World, 2005)**

Natural History of Diseases

Asymptomatic

Onset of symptoms
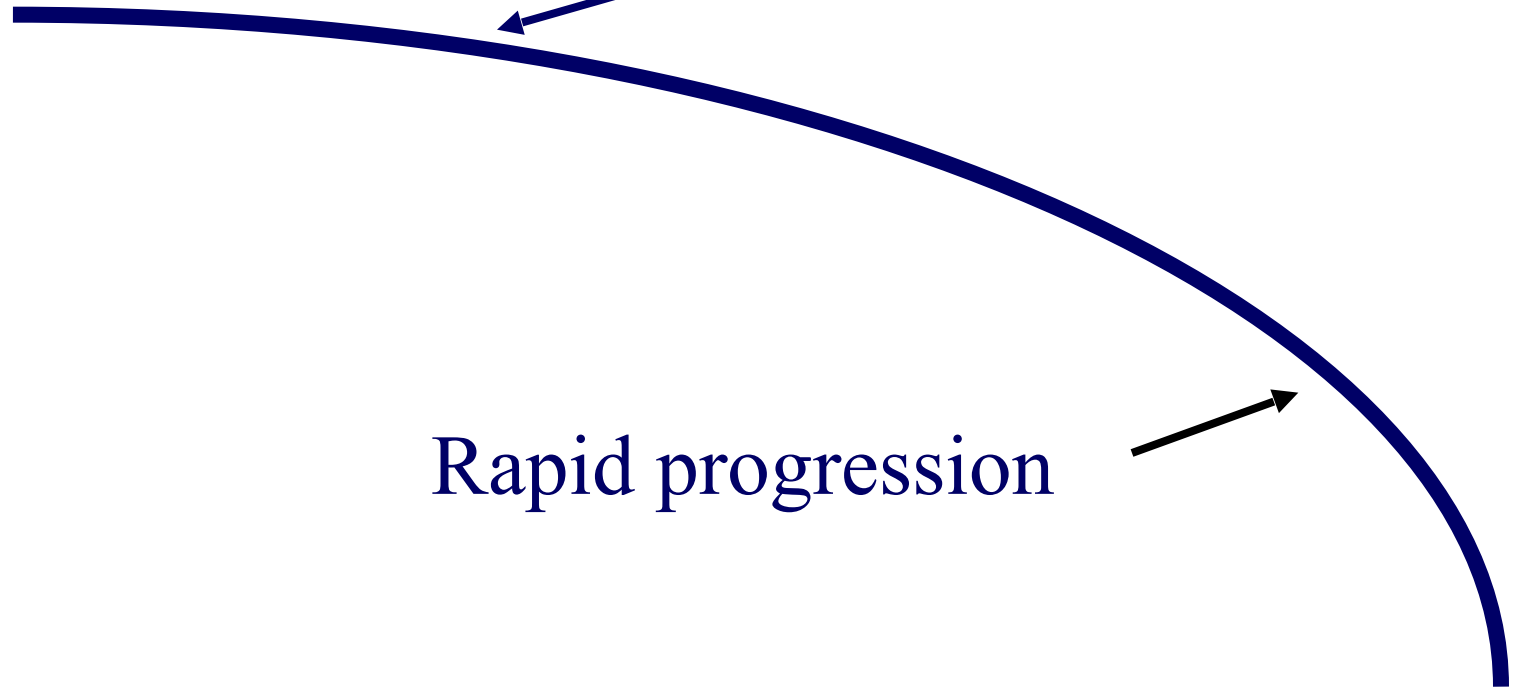
Rapid progression

Death

Illness and Health

Disease free

Sick

Healthy

Health

Death

Quality of life

Fullest capacity

Medical   care

Disease prevention

Health promotion

Health Promotion
Who is Responsible?

1. **Government**
2. **Family, Individual**
3. **Health Care Provider**

Life Style Change

飲食 (Diet)

運動 (Exercise)

放鬆 (Relaxation)

Systemic Implementation
Six Prong Approach

Strategy

- **Enterprise-wide implementation**
- **Mobilize the entire staff**
- **Put in the necessary resources**
- **Institution reengineering**

Vegetarian Diet

Omnivorous diet required 2.9 times more water, 2.5 times more primary energy, 13 times more fertilizer, and 1.4 times more pesticides.

Marlow HJ, Hayes WK, Soret S, Carter RL, Schwab ER, Sabate J. Diet and the environment: does what you eat matter? *Am J Clin Nutr*. May 2009;89(5):1699S-1703S.

Hospital & Environment

1. **Energy efficiency**
2. **Green building design**
3. **Alternative energy generation**
4. **Transportation**
5. **Food**
6. **Waste**
7. **Water**

Reduce , Reuse & Recycle

- **Patients use reusable plates, bowels**
- **Reusable chopsticks, 3 million pairs in 7 years**

因　The Reason

貪　**Greed**

瞋　**Jealousy**

癡　**Ignorance**

Stand tall, Don't be intimidated
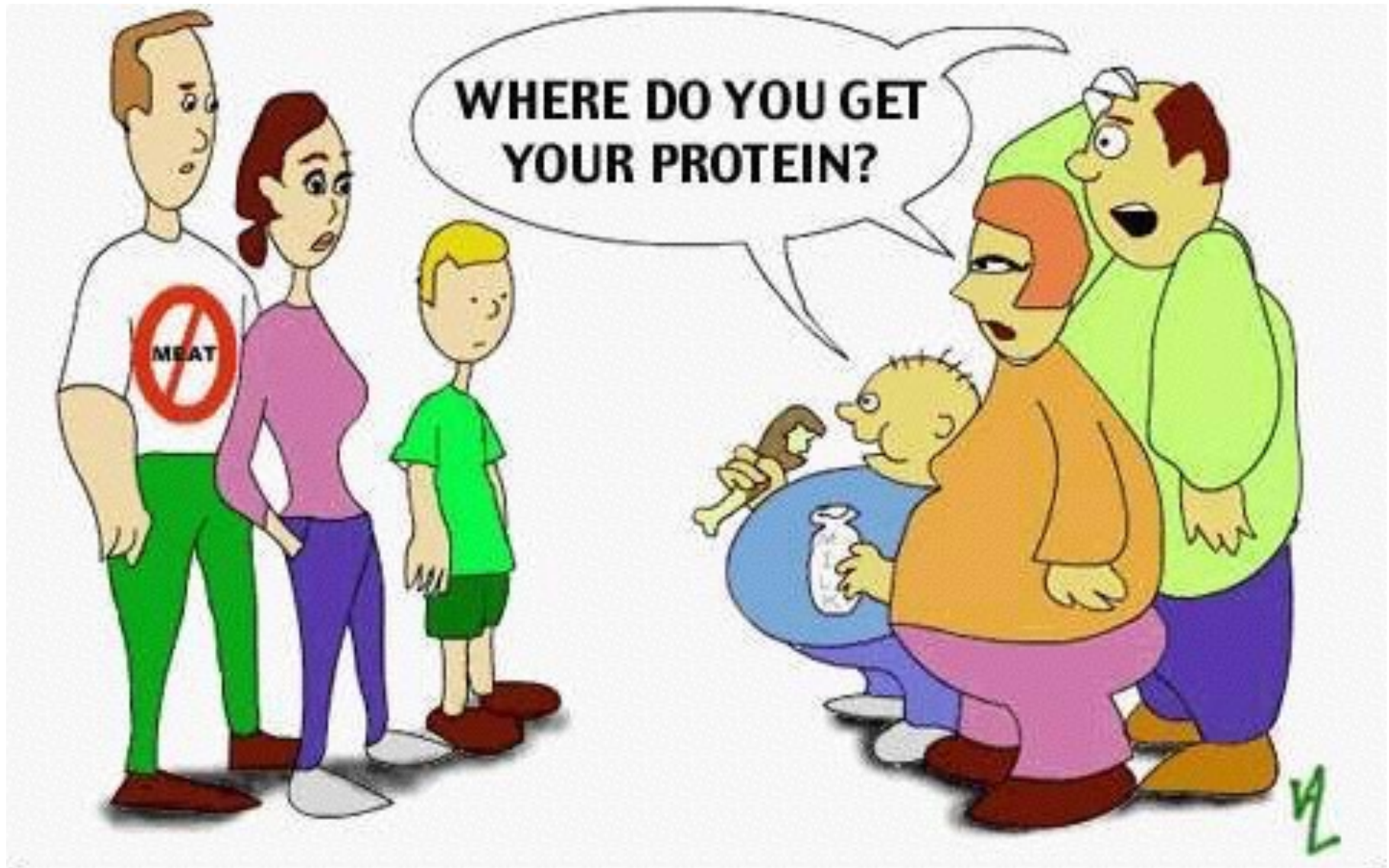
Enlarging...

Livestock's long shadow

FAO (2006)

- **Livestock accounts for 18% of greenhouse gas emission (and 80% from agricultural sector)**

- **Land degradation**

- **Water depletion and pollution**

- **Air pollution**

- **Impact on biodiversity**

livestock's long shadow
environmental issues and options

How did livestock contribute to GHG emission

- **Energy: burning fossil fuels to produce fertilizers for feed crops**
- **Manufacturing Industry**
- **Waste**
- **Land use change/forestry/agriculture**
- **(Respiration by livestock not counted)**

Amazonian Rainforests

70% Rainforest degraded for cattle rearing

Home to 40,000 plant species, 427 mammals, 1,294 birds, 378 reptiles, 427 amphibians, 3,000 species of fish, and 200,000 indigenous people from 180 ethnic tribes

Livestocks: <1.5% of global economy

Other economic potentials for the rainforest?

(Green Peace Report)
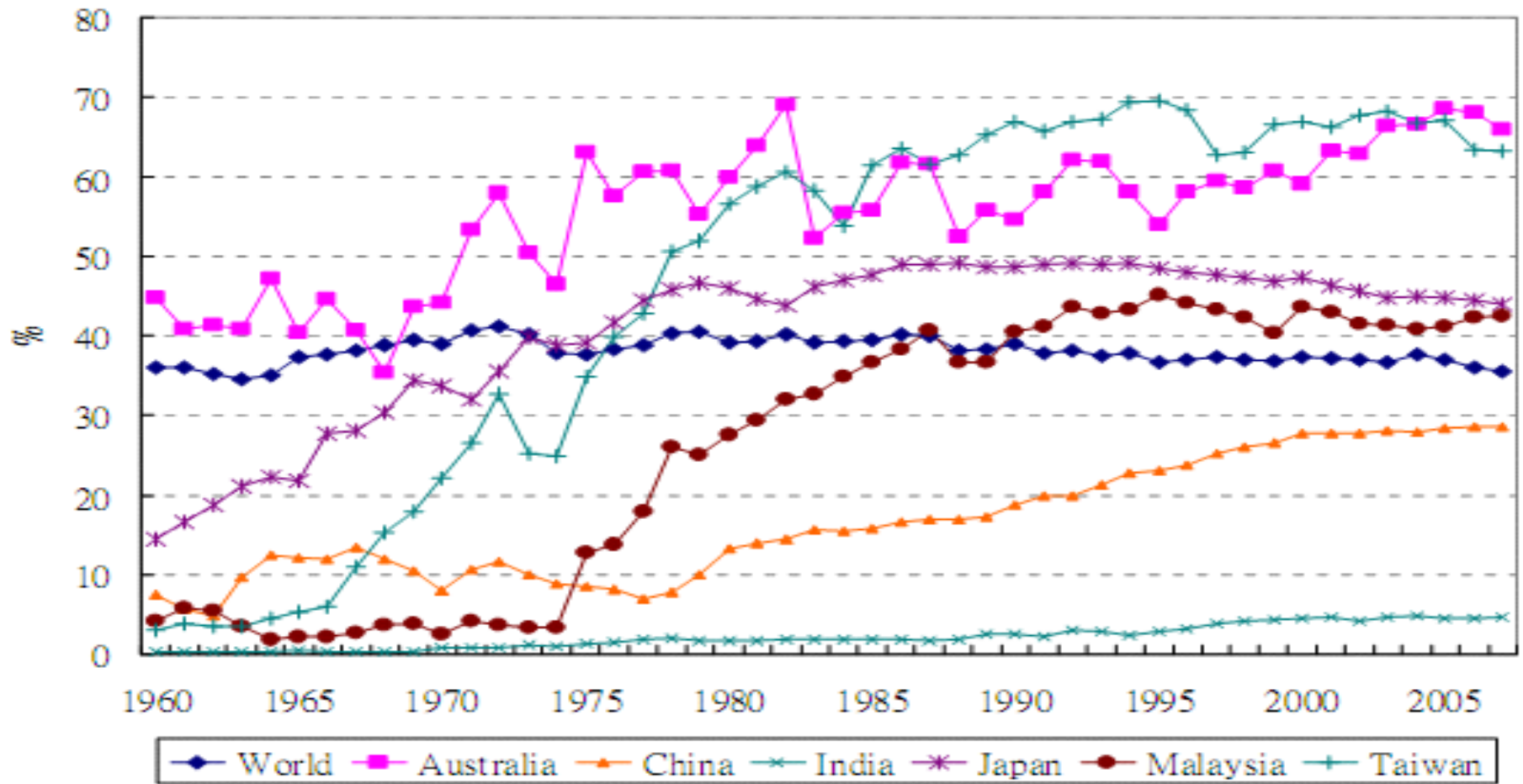
Figure 1: Percent of grain consumed fed to livestock. Data retrieved from World Resource Institute online database.

Chiu TH, Lin CL. Asia Pac J Clin Nutr (Dec, 2009)

慈濟醫療志業 Tzu Chi Medicine Mission

World Watch Institute 2009/Nov/Dec Issue

Uncounted, Overlooked, and Misallocated Livestock-related GHG Emissions

	Annual GHG emissions (CO_2e)	Percentage of worldwide total
	million tons	
FAO estimate	7,516	11.8
Uncounted in current GHG inventories:		
1. Overlooked respiration by livestock	8,769	13.7
2. Overlooked land use	≥2,672	≥4.2
3. Undercounted methane	5,047	7.9
4. Other four categories (see text)	≥5,560	≥8.7
Subtotal	≥22,048	≥34.5
Misallocated in current GHG inventories:		
5. Three categories (see text)	≥3,000	≥4.7
Total GHGs attributable to livestock products	≥32,564	≥51.0

Food and Green House Gas

The Green House Gas production

Plant-based VS. Animal-based Food
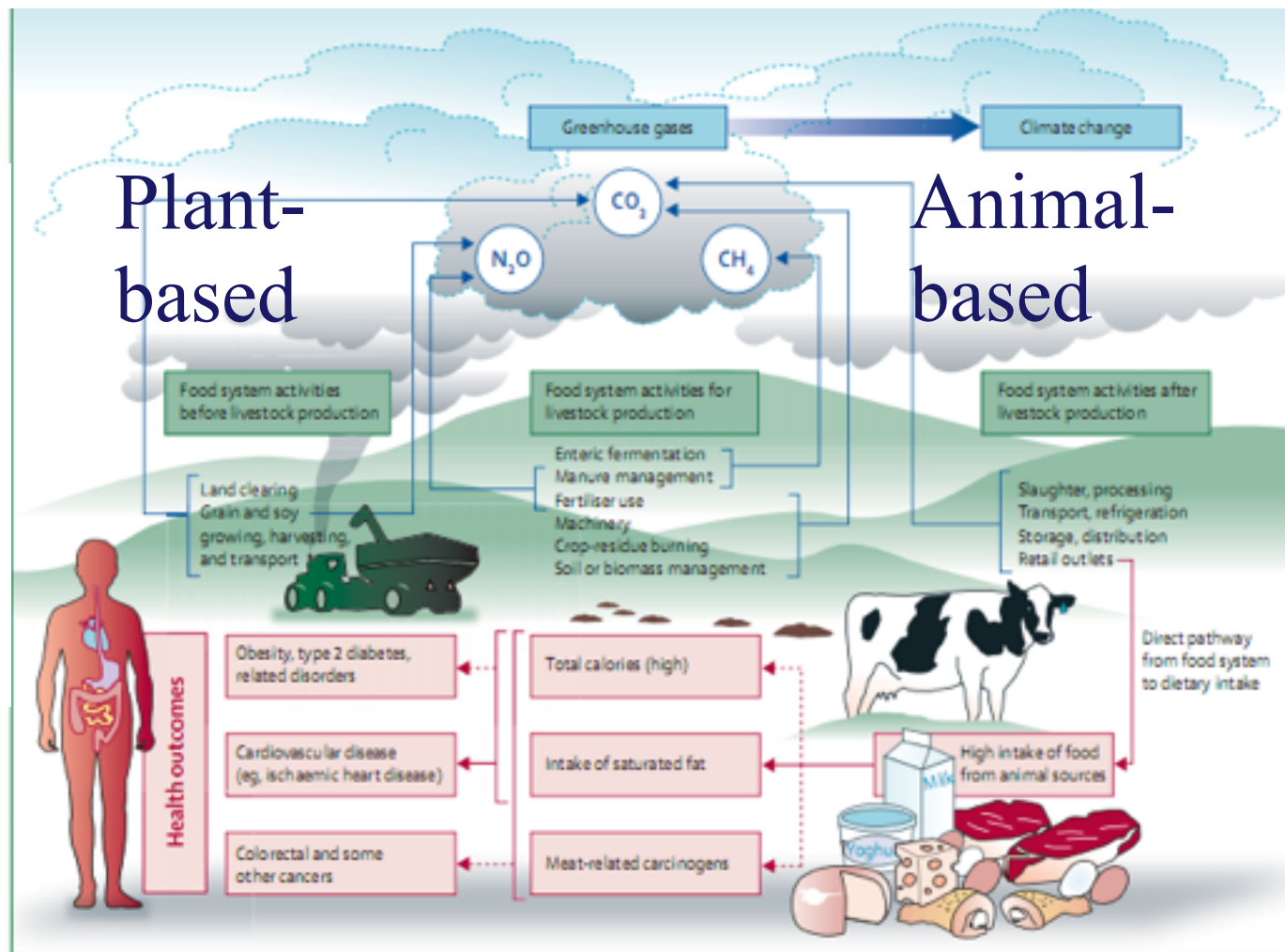
Green House Gas Production

Production--Slaughtering
Refrigeration--Storage
Transportation
Cooking
Retailing

Consumption of Natural Resources

- **Slaughtering**
- **Packaging**
- **Refrigeration**
- **Transportation**

Food Mileage
食品旅程

High

1. **Processed**
2. **Imported**
3. **Animal Products**

Low

1. **Local**
2. **Fresh**
3. **Plant-based**
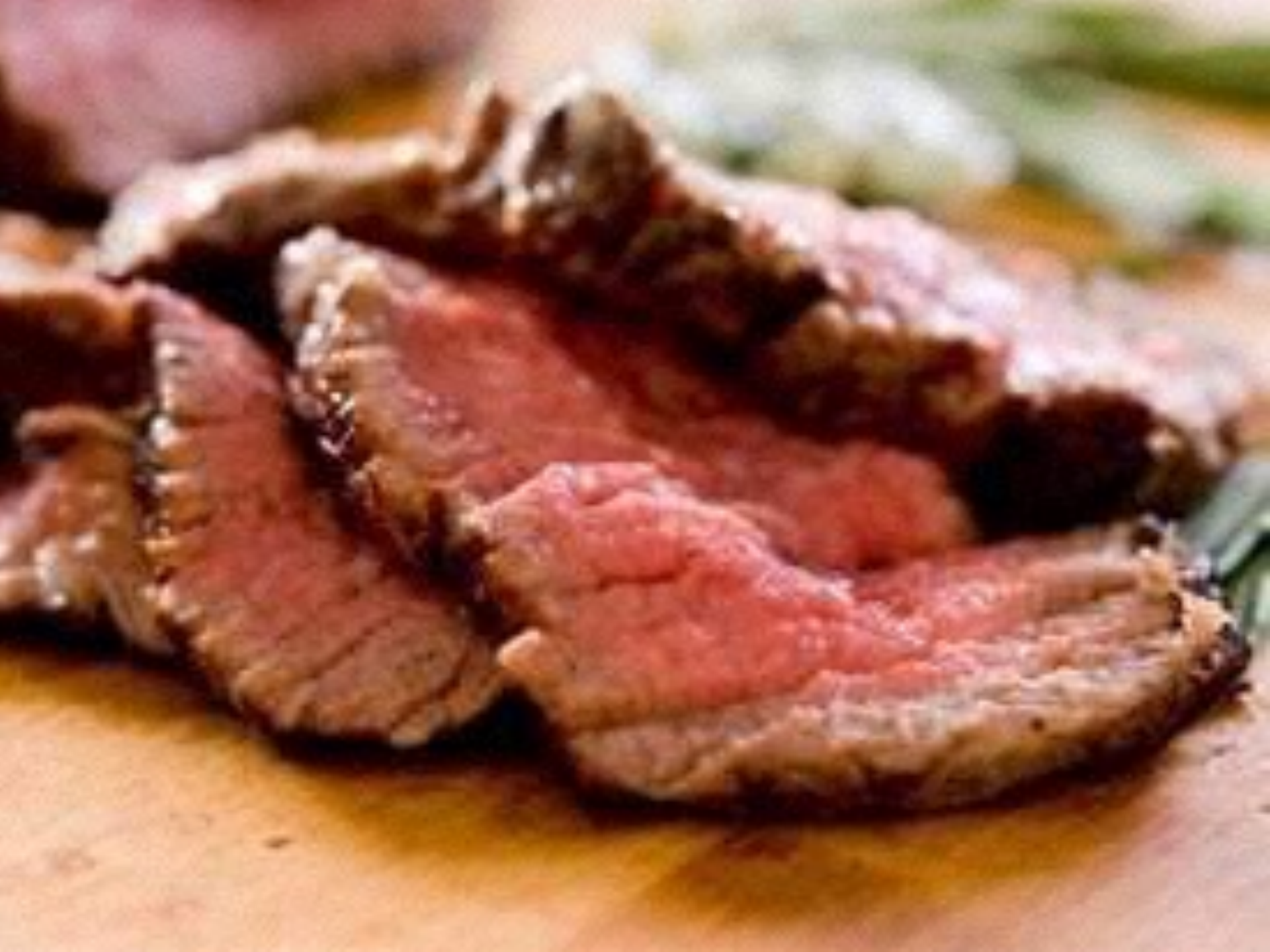
©Tasty Palette
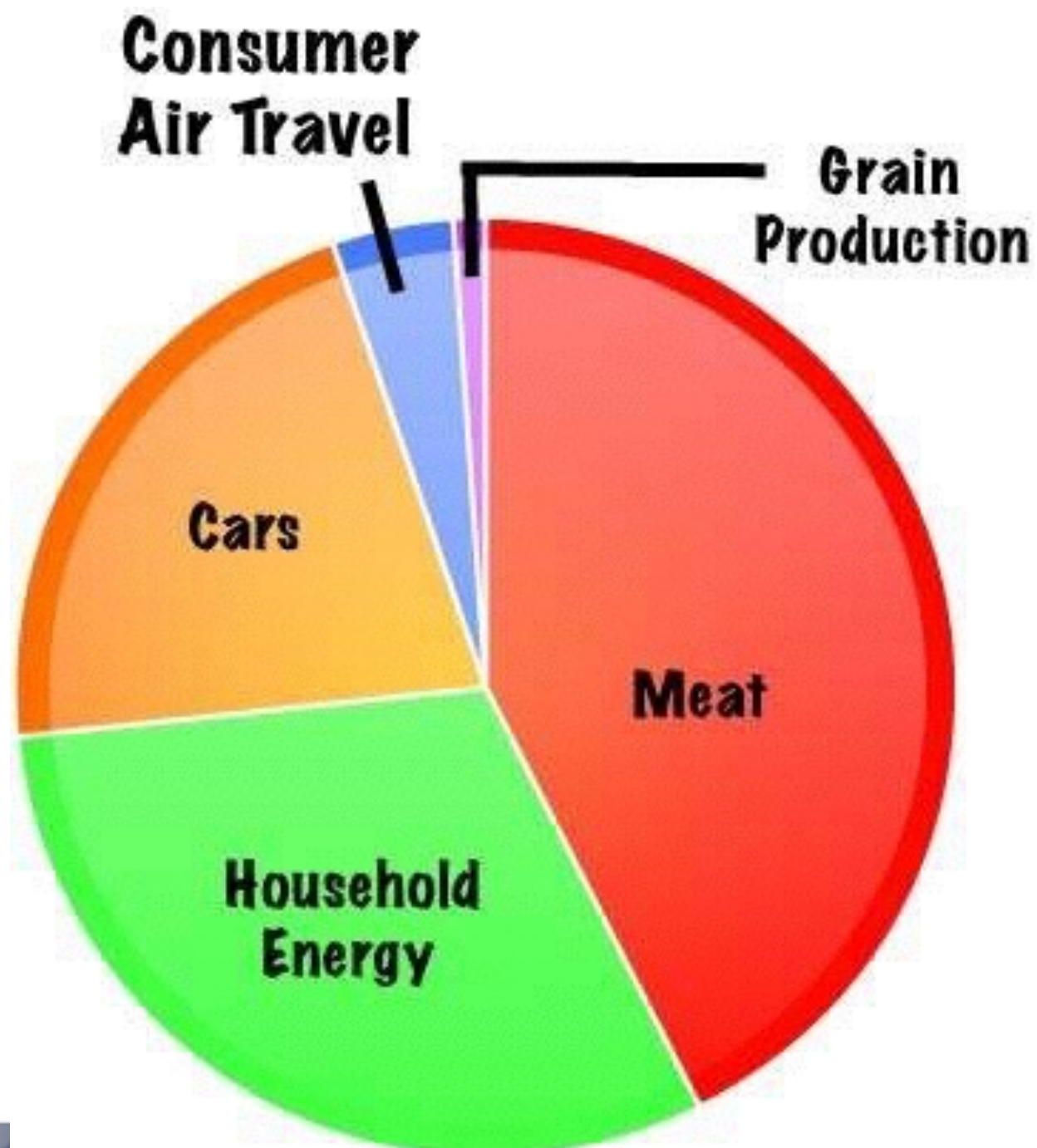
GHG reduction in 6 Tzu Chi hospitals that serve complete vegetarian meals

- CO2 equivalent emission calculation:
  1kg of meat → average13.7kg CO2
- An average meal in an omnivorous food court in Taiwan contains 70g (or 0.07 kg) meat per meal
- In 2011, a total of 2,543,669 vegetarian meals served in 6 Tzu Chi hospitals
- 2,543,669 meals * 0.07kg meat/meal = 178,057 kg meat
- 178,057 kg meat * 13.7kg CO2/kg meat = 2,439,379 kg CO2.
- Average 2,439,379 kg CO2 saved in the year 2011!

Vegetarian Meals for Patients

- No fish, meat, poultry or any animal flesh served in Tzu Chi Hospitals

- Lacto-ovo vegetarian meals, vegan options available

- Meeting Taiwan's DRIs through plant based diets

- Featuring fresh and local produces

- Minimizing processed and canned foods

Protein

- Major protein source: soy (tofu, yuba, bean curd, and other soy products), eggs, beans, milk and milk products

- Other protein sources: grains, vegetables, seeds and nuts

- High protein formula (for those with special needs)

Soy bean curd with red and yellow pepper in tomato sauce

Stir-fry spinach

Tofu wrapped in veggie ham

Stir-fry bok choy and carrots

平安吉祥

Rice with black sesame

Tofu and bean sprout soup

Fresh melon

Stir fry egg plants

Asparagus with baby corn and sweet pepper

Broccoli and carrots with black mushrooms

Laver (seaweed) soup with gogi berries

Tofu wrapped in veggie ham

Noodles

Fresh fruit plate

Soups and Snacks

Toona rice with pinenuts

Peanut – Azuki bean – Tapioca Dissert

Vegetarian Food Court for patients, families, visitors and staff

- Minder Garden (vegan buffet with 100+dishes)
- Thai House
- Hot Pots
- Noodle Shop
- Pancake Kitchen
- Traditional Taiwanese food
- Japanese Style
- Korean Style
- And more …

Vegan Buffet

Vegetarian Food Court

Great Love Farm

On empty land around the hospital, we grow vegetable, rice.

As a rehabilitation program for our patients

Tzuchi's Experimental Farms in Taiwan

Tzuchi's Experimental Farms in Hualien

Experimental Farms in South Africa
(Durban)

Myanmar after hurricane Nagis

納吉斯熱帶氣旋的路徑

Very heavy casualties

災區大批屍體受到豔陽曝曬腐爛未能處理

We provided emergency relief, free medical assistance

歷史性的一刻：五月十五日，慈濟旗首次豎立
於

慈濟醫療志業 Tzu Chi Medicine M用恭敬的態度迎接來到發放現場的災民。

A international team provided cataract surgery

And we provided improved seeds to grow rice
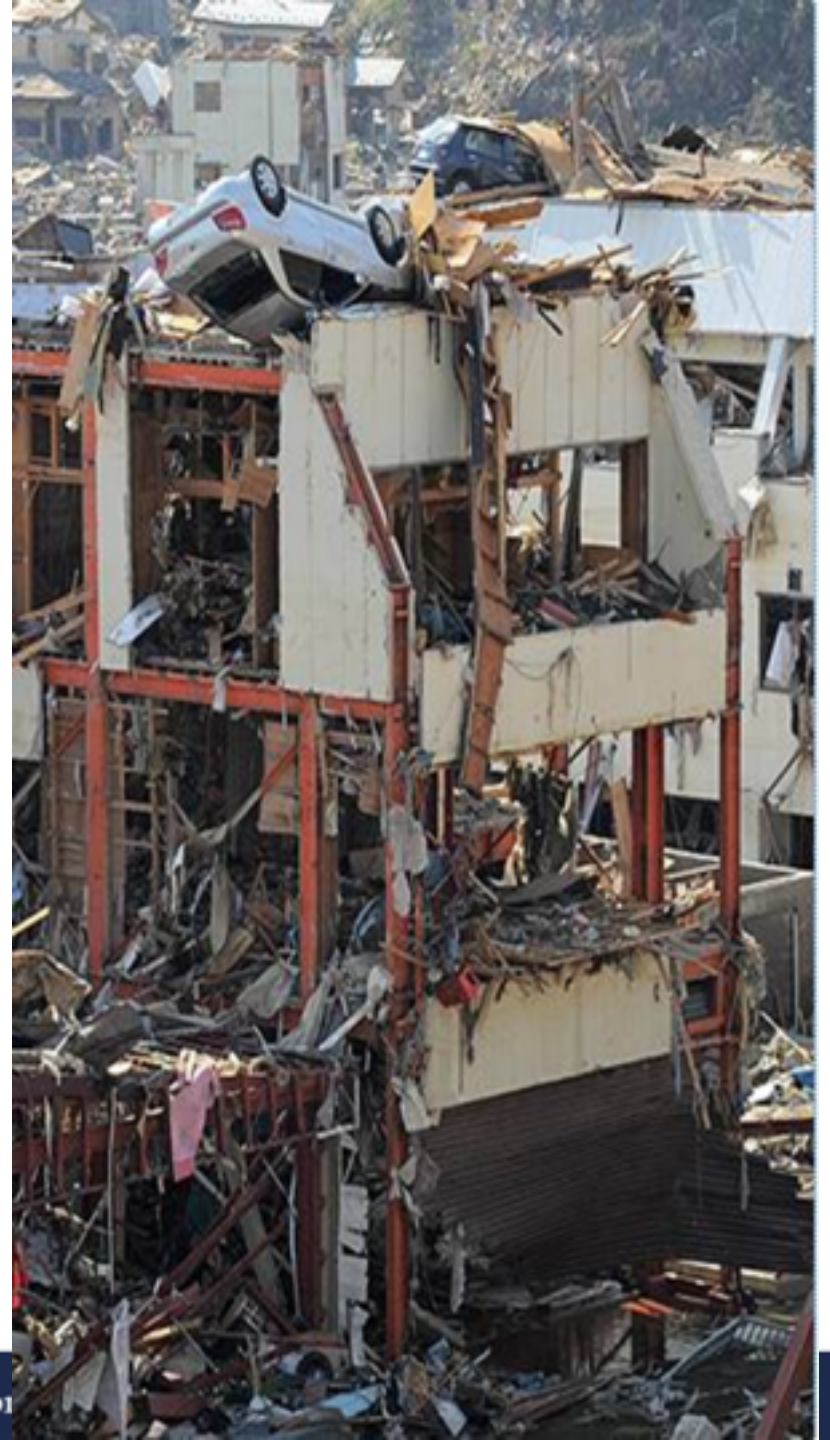
Always with grace

慈濟醫療志業 Tzu Chi Medicine Mission

Always with grace

Precooked instant vegetarian rice

We prepare hot vegetarian meals inside the shelter

Or outside the shelter

Australia

Da Ai
Headlines
www.newdaai.tv

Sharing Dalin Hospital model

重頭戲　慈濟主辦的研討講座

Impact on Our Health

The Chances of Developing Diseases

Diet group	BMI[2]	Diabetes[3]	Hypertension[3]
Nonvegetarian	28.26 (28.22, 28.30)	1.00	1.00
Semivegetarian	27.00 (26.96, 27.04)	0.72 (0.65, 0.79)	0.77 (0.72, 0.82)
Pescovegetarian	25.73 (25.69, 25.77)	0.49 (0.44, 0.55)	0.62 (0.59, 0.66)
Lactoovo-vegetarian	25.48 (25.44, 25.52)	0.39 (0.36, 0.42)	0.45 (0.44, 0.47)
Vegan	23.13 (23.09, 23.16)	0.22 (0.18, 0.28)	0.25 (0.22, 0.28)
P^4	0.0001	0.0001	0.0001

Our experiences of Plant-based Diets
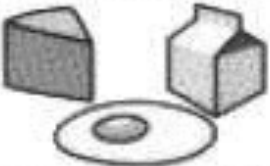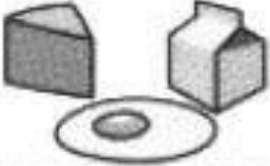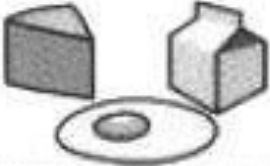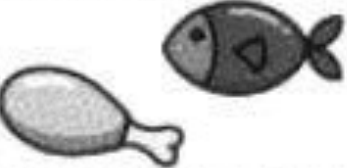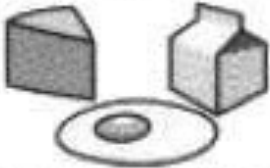
We have been offering for many years at our hospitals

Healthful, delicious and nutritious

The acceptance of staff, patients, families and visitors have been very high

Can be a very good educational experience

Type of Vegetarians

	%	BEEF	POULTRY/FISH	DAIRY/EGGS
VEGAN	4.3	NONE	NONE	NONE
LACTO-OVO	34.0	NONE	NONE	
PESCO-VEGE	9.7	NONE		
SEMI-VEGE	8.3			
NON-VEGE	43.7			

Diet group	BMI[2]	Diabetes[3]	Hypertension[3]
Nonvegetarian	28.26 (28.22, 28.30)	1.00	1.00
Semivegetarian	27.00 (26.96, 27.04)	0.72 (0.65, 0.79)	0.77 (0.72, 0.82)
Pescovegetarian	25.73 (25.69, 25.77)	0.49 (0.44, 0.55)	0.62 (0.59, 0.66)
Lactoovo-vegetarian	25.48 (25.44, 25.52)	0.39 (0.36, 0.42)	0.45 (0.44, 0.47)
Vegan	23.13 (23.09, 23.16)	0.22 (0.18, 0.28)	0.25 (0.22, 0.28)
P^4	0.0001	0.0001	0.0001

Benefits of a plant based diet or a vegetarian diet

- **Low in cholesterol and saturated fat**
- **High in fiber**
- **High in vitamin C, folate, Mg, beta-carotenes and other carotenoids … nutrients that prevents chronic diseases**
- **High in phytochemicals**
- **Nutritionally adequate for supporting all stages of lives**
- **The most effective and practical way to reduce carbon foot print**

Health consequences of 30% reduction in livestocks

- **Reduction in saturated fat from meat and dairy will lead to a reduction in heart disease by 15% in UK and by 16% in city of Sao Paulo, Brazil.**

- **Other additional health benefits for obesity, diabetes, hypertension, diet related cancer.**

Friel et al. Lancet, Dec, 2009

The Evidence is in!

"It is the position of the American Dietetic Association that appropriately planned vegetarian diets, including total vegetarian or vegan diets, are healthful, nutritionally adequate, and may provide health benefits in the prevention and treatment of certain diseases. Well-planned vegetarian diets are appropriate for individuals during all stages of the life cycle, including pregnancy, lactation, infancy, childhood, and adolescence, and for athletes."

Position Paper on Vegetarian Diets 2009

Plant-based Diets

Healthful, delicious and nutritious

We have been offering for many years at our hospitals

The acceptance of staff, patients, families and visitors have been very high

Can be a very good educational experience

Red Meat Consumption and Mortality: Results From 2 Prospective Cohort Studies.

Pan A, Sun Q, Bernstein AM, Schulze MB, Manson JE, Stampfer MJ, Willett WC, Hu FB.

CONCLUSIONS:

Red meat consumption is associated with an increased risk of total, CVD, and cancer mortality. Substitution of other healthy protein sources for red meat is associated with a lower mortality risk.

All-Cause Mortality According to Red Meat Intake in the Health Professionals Follow-up Study and the Nurses' Health Study

Table 2. All-Cause Mortality According to Red Meat Intake in the Health Professionals Follow-up Study and the Nurses' Health Study

Variable	Q1	Q2	Q3	Q4	Q5	P Value for Trend	HR (95% CI) for a 1-Serving-per-Day Increase
Health Professionals Follow-up Study							
Total red meat, servings per day[b]	0.25 (0.13-0.37)	0.61 (0.53-0.70)	0.95 (0.87-1.04)	1.36 (1.24-1.49)	2.07 (1.83-2.47)	NA	NA
Cases/person-years, No.	1713/151 212	1610/152 120	1679/151 556	1794/152 318	2130/151 315	NA	NA
Age-adjusted model	1 [Reference]	1.06 (0.99-1.14)	1.14 (1.06-1.21)	1.21 (1.14-1.30)	1.45 (1.36-1.54)	<.001	1.19 (1.16-1.23)
Multivariate model[c]	1 [Reference]	1.12 (1.05-1.20)	1.21 (1.13-1.30)	1.25 (1.16-1.34)	1.37 (1.27-1.47)	<.001	1.14 (1.10-1.17)
Unprocessed red meat, servings per day[b]	0.17 (0.07-0.24)	0.43 (0.37-0.47)	0.66 (0.58-0.73)	0.95 (0.87-1.04)	1.46 (1.29-1.67)	NA	NA
Cases/person-years, No.	1855/150 676	1722/149 097	1535/154 352	1819/150 925	1995/153 474	NA	NA
Age-adjusted model	1 [Reference]	1.06 (0.99-1.13)	1.00 (0.94-1.07)	1.15 (1.08-1.23)	1.34 (1.25-1.42)	<.001	1.22 (1.16-1.27)
Multivariate model[c]	1 [Reference]	1.11 (1.04-1.18)	1.14 (1.06-1.22)	1.20 (1.12-1.28)	1.29 (1.20-1.38)	<.001	1.17 (1.12-1.21)
Processed red meat, servings per day[b]	0.02 (0-0.07)	0.13 (0.10-0.14)	0.21 (0.20-0.26)	0.39 (0.34-0.46)	0.74 (0.64-1.00)	NA	NA
Cases/person-years, No.	1917/171 619	1395/131 069	1661/152 481	1717/152 128	2236/151 227	NA	NA
Age-adjusted model	1 [Reference]	0.99 (0.93-1.06)	1.13 (1.05-1.20)	1.14 (1.07-1.22)	1.38 (1.30-1.47)	<.001	1.34 (1.28-1.40)
Multivariate model[c]	1 [Reference]	1.06 (0.99-1.14)	1.15 (1.07-1.23)	1.18 (1.10-1.27)	1.27 (1.19-1.36)	<.001	1.18 (1.12-1.24)
Nurses' Health Study							
Total red meat, servings per day[b]	0.51 (0.37-0.61)	0.85 (0.76-0.96)	1.14 (1.03-1.32)	1.49 (1.33-1.71)	2.17 (1.85-2.66)	NA	NA
Cases/person-years, No.	2946/438 326	2759/442 134	2656/439 712	2872/440 329	3765/439 391	NA	NA
Age-adjusted model	1 [Reference]	1.07 (1.01-1.12)	1.09 (1.04-1.15)	1.24 (1.19-1.30)	1.61 (1.53-1.69)	<.001	1.30 (1.26-1.33)
Multivariate model[c]	1 [Reference]	1.08 (1.02-1.14)	1.11 (1.05-1.17)	1.18 (1.12-1.24)	1.24 (1.17-1.30)	<.001	1.11 (1.08-1.13)
Unprocessed red meat, servings per day[b]	0.37 (0.28-0.46)	0.61 (0.56-0.68)	0.86 (0.77-1.00)	1.13 (1.01-1.28)	1.64 (1.43-2.05)	NA	NA
Cases/person-years, No.	3079/441 061	2885/441 207	2545/439 306	2709/431 097	3782/447 240	NA	NA
Age-adjusted model	1 [Reference]	1.05 (1.00-1.11)	0.98 (0.93-1.03)	1.09 (1.03-1.14)	1.48 (1.41-1.55)	<.001	1.31 (1.28-1.35)
Multivariate model[c]	1 [Reference]	1.07 (1.01-1.12)	1.07 (1.01-1.12)	1.10 (1.05-1.16)	1.19 (1.13-1.25)	<.001	1.10 (1.06-1.13)
Processed red meat, servings per day[b]	0.05 (0-0.11)	0.14 (0.13-0.16)	0.23 (0.21-0.28)	0.36 (0.33-0.42)	0.64 (0.56-0.87)	NA	NA
Cases/person-years, No.	3076/442 594	2799/420 403	2776/455 365	2814/441 369	3533/440 161	NA	NA
Age-adjusted model	1 [Reference]	1.06 (1.01-1.12)	1.10 (1.04-1.16)	1.18 (1.12-1.24)	1.49 (1.42-1.56)	<.001	1.61 (1.54-1.69)
Multivariate model[c]	1 [Reference]	1.04 (0.99-1.10)	1.08 (1.03-1.14)	1.14 (1.08-1.20)	1.20 (1.14-1.27)	<.001	1.21 (1.15-1.27)
Pooled Results[d]							
Total red meat	1 [Reference]	1.10 (1.05-1.14)	1.15 (1.06-1.26)	1.21 (1.14-1.28)	1.30 (1.18-1.43)	<.001	1.12 (1.09-1.15)
Unprocessed red meat	1 [Reference]	1.08 (1.05-1.12)	1.10 (1.03-1.17)	1.15 (1.05-1.25)	1.23 (1.14-1.34)	<.001	1.13 (1.07-1.20)
Processed red meat	1 [Reference]	1.05 (1.00-1.09)	1.11 (1.04-1.18)	1.15 (1.11-1.20)	1.23 (1.16-1.30)	<.001	1.20 (1.15-1.24)

Abbreviations: HR, hazard ratio; NA, not applicable.
[a] Data are given as HR (95% CI) except where indicated otherwise.
[b] Data are given as median (interquartile range).
[c] The multivariate model was adjusted for age (continuous); body mass index (calculated as weight in kilograms divided by height in meters squared) category (<23.0, 23.0-24.9, 25.0-29.9, 30.0-34.9, or ≥35.0); alcohol consumption (0, 0.1-4.9, 5.0-29.9, or ≥30.0 g/d in men; 0, 0.1-4.9, 5.0-14.9, or ≥15.0 g/d in women); physical activity level (<3.0, 3.0-8.9, 9.0-17.9, 18.0-26.9, or ≥27.0 hours of metabolic equivalent tasks per week); smoking status (never, past, or current [1-14, 15-24, or ≥25 cigarettes per day]); race (white or nonwhite); menopausal status and hormone use in women (premenopausal, postmenopausal never users, postmenopausal past users, or postmenopausal current users); family history of diabetes mellitus, myocardial infarction, or cancer; history of diabetes mellitus, hypertension, or hypercholesterolemia; and intakes of total energy, whole grains, fruits, and vegetables, all in quintiles.
[d] Results from the multivariate model were combined using the random-effects model.

Pan, A. et al. Arch Intern Med 2012;0:archinternmed.2011.2287v1-9.

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Cardiovascular Mortality According to Red Meat Intake in the Health Professionals Follow-up Study and the Nurses' Health Study

Table 3. Cardiovascular Mortality According to Red Meat Intake in the Health Professionals Follow-up Study and the Nurses' Health Study

Variable	Frequency of Consumption Quintiles[a]					P Value for Trend	HR (95% CI) for a 1-Serving-per-Day Increase
	Q1	Q2	Q3	Q4	Q5		
Health Professionals Follow-up Study							
Total red meat							
Cases/person-years, No.	537/152 293	490/153 126	506/152 623	518/153 454	665/152 647	NA	NA
Age-adjusted model	1 [Reference]	1.05 (0.93-1.19)	1.11 (0.96-1.26)	1.15 (1.02-1.30)	1.48 (1.32-1.66)	<.001	1.21 (1.16-1.27)
Multivariate model[b]	1 [Reference]	1.09 (0.96-1.24)	1.16 (1.03-1.32)	1.17 (1.03-1.33)	1.35 (1.19-1.53)	<.001	1.14 (1.08-1.20)
Unprocessed red meat							
Cases/person-years, No.	578/151 850	526/150 172	446/155 316	532/152 087	632/154 719	NA	NA
Age-adjusted model	1 [Reference]	1.08 (0.95-1.20)	0.97 (0.86-1.10)	1.11 (0.98-1.25)	1.41 (1.26-1.58)	<.001	1.26 (1.18-1.34)
Multivariate model[b]	1 [Reference]	1.10 (0.97-1.24)	1.08 (0.95-1.22)	1.14 (1.01-1.29)	1.32 (1.16-1.49)	<.001	1.19 (1.10-1.27)
Processed red meat							
Cases/person-years, No.	594/172 617	425/131 953	510/153 537	512/153 206	677/152 631	NA	NA
Age-adjusted model	1 [Reference]	0.99 (0.88-1.12)	1.14 (1.01-1.29)	1.13 (1.00-1.27)	1.37 (1.23-1.53)	<.001	1.34 (1.24-1.46)
Multivariate model[b]	1 [Reference]	1.05 (0.93-1.19)	1.15 (1.01-1.30)	1.15 (1.02-1.31)	1.25 (1.11-1.41)	.003	1.17 (1.07-1.29)
Nurses' Health Study							
Total red meat							
Cases/person-years, No.	601/440 429	570/444 046	517/441 619	598/442 319	908/441 994	NA	NA
Age-adjusted model	1 [Reference]	1.11 (0.99-1.25)	1.09 (0.97-1.22)	1.33 (1.19-1.49)	1.98 (1.79-2.20)	<.001	1.44 (1.38-1.50)
Multivariate model[b]	1 [Reference]	1.14 (1.01-1.27)	1.11 (0.99-1.26)	1.28 (1.13-1.43)	1.45 (1.30-1.63)	<.001	1.17 (1.11-1.22)
Unprocessed red meat							
Cases/person-years, No.	617/443 224	646/443 182	481/441 163	549/432 988	901/449 850	NA	NA
Age-adjusted model	1 [Reference]	1.21 (1.08-1.35)	0.96 (0.85-1.09)	1.15 (1.03-1.29)	1.82 (1.65-2.02)	<.001	1.46 (1.39-1.54)
Multivariate model[b]	1 [Reference]	1.22 (1.09-1.37)	1.09 (0.96-1.23)	1.19 (1.06-1.34)	1.39 (1.24-1.55)	<.001	1.17 (1.10-1.24)
Processed red meat							
Cases/person-years, No.	671/444 737	551/422 411	586/457 265	572/443 383	814/442 609	NA	NA
Age-adjusted model	1 [Reference]	0.98 (0.88-1.10)	1.10 (0.99-1.23)	1.16 (1.03-1.29)	1.65 (1.49-1.83)	<.001	1.79 (1.64-1.95)
Multivariate model[b]	1 [Reference]	0.97 (0.87-1.09)	1.10 (0.99-1.23)	1.12 (0.99-1.25)	1.29 (1.15-1.43)	<.001	1.26 (1.15-1.39)
Pooled Results[c]							
Total red meat	1 [Reference]	1.12 (1.03-1.22)	1.13 (1.04-1.24)	1.23 (1.13-1.34)	1.40 (1.29-1.53)	<.001	1.16 (1.12-1.20)
Unprocessed red meat	1 [Reference]	1.16 (1.05-1.28)	1.09 (1.00-1.18)	1.17 (1.07-1.27)	1.36 (1.25-1.47)	<.001	1.18 (1.13-1.23)
Processed red meat	1 [Reference]	1.01 (0.92-1.10)	1.12 (1.03-1.22)	1.13 (1.04-1.23)	1.27 (1.16-1.38)	<.001	1.21 (1.13-1.31)

Abbreviations: HR, hazard ratio; NA, not applicable.
[a] Data are given as HR (95% CI) except where indicated otherwise.
[b] The multivariate model was adjusted for age (continuous), body mass index (calculated as weight in kilograms divided by height in meters squared) category (<23.0, 23.0-24.9, 25.0-29.9, 30.0-34.9, or ≥35.0); alcohol consumption (0, 0.1-4.9, 5.0-29.9, or ≥30.0 g/d in men; 0, 0.1-4.9, 5.0-14.9, or ≥15.0 g/d in women); physical activity level (<3.0, 3.0-8.9, 9.0-17.9, 18.0-26.9, or ≥27.0 hours of metabolic equivalent tasks per week); smoking status (never, past, or current [1-14, 15-24, or ≥25 cigarettes per day]); race (white or nonwhite); menopausal status and hormone use in women (premenopausal, postmenopausal never users, postmenopausal past users, or postmenopausal current users); family history of diabetes mellitus, myocardial infarction, or cancer; history of diabetes mellitus, hypertension, or hypercholesterolemia; and intakes of total energy, whole grains, fruits, and vegetables, all in quintiles.
[c] Results from multivariate model were combined using the random-effects model.

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Cancer Mortality According to Red Meat Intake in the Health Professionals Follow-up Study and the Nurses' Health Study

Table 4. Cancer Mortality According to Red Meat Intake in the Health Professionals Follow-up Study and the Nurses' Health Study

Variable	Frequency of Consumption Quintiles[a]					P Value for Trend	HR (95% CI) for a 1-Serving-per-Day Increase
	Q1	Q2	Q3	Q4	Q5		
Health Professionals Follow-up Study							
Total red meat							
Cases/person-years, No.	538/152 206	558/153 082	561/152 574	646/153 343	710/152 584	NA	NA
Age-adjusted model	1 [Reference]	1.03 (0.91-1.15)	1.05 (0.93-1.18)	1.20 (1.07-1.34)	1.33 (1.20-1.49)	<.001	1.17 (1.12-1.22)
Multivariate model[b]	1 [Reference]	1.05 (0.94-1.18)	1.07 (0.95-1.20)	1.18 (1.05-1.33)	1.24 (1.09-1.40)	<.001	1.12 (1.06-1.17)
Unprocessed red meat							
Cases/person-years, No.	650/151 745	588/150 121	540/155 255	613/152 008	682/154 661	NA	NA
Age-adjusted model	1 [Reference]	1.00 (0.89-1.12)	0.97 (0.86-1.08)	1.06 (0.95-1.18)	1.25 (1.12-1.39)	<.001	1.18 (1.11-1.26)
Multivariate model[b]	1 [Reference]	1.01 (0.90-1.13)	1.03 (0.91-1.15)	1.05 (0.94-1.18)	1.18 (1.05-1.33)	<.001	1.13 (1.05-1.21)
Processed red meat							
Cases/person-years, No.	669/172 756	457/131 895	580/153 463	583/153 122	748/152 551	NA	NA
Age-adjusted model	1 [Reference]	0.97 (0.86-1.09)	1.09 (0.98-1.22)	1.09 (0.97-1.21)	1.28 (1.15-1.42)	<.001	1.31 (1.21-1.41)
Multivariate model[b]	1 [Reference]	1.00 (0.89-1.12)	1.07 (0.96-1.20)	1.07 (0.95-1.20)	1.15 (1.02-1.29)	<.001	1.17 (1.07-1.27)
Nurses' Health Study							
Total red meat							
Cases/person-years, No.	1264/439 774	1191/443 495	1185/440 970	1263/441 727	1488/441 393	NA	NA
Age-adjusted model	1 [Reference]	1.04 (0.96-1.13)	1.08 (1.00-1.17)	1.19 (1.10-1.29)	1.39 (1.29-1.50)	<.001	1.21 (1.17-1.25)
Multivariate model[b]	1 [Reference]	1.05 (0.97-1.14)	1.10 (1.01-1.19)	1.15 (1.06-1.25)	1.17 (1.08-1.28)	<.001	1.09 (1.05-1.13)
Unprocessed red meat							
Cases/person-years, No.	1308/442 572	1222/442 671	1120/440 530	1215/432 361	1526/449 225	NA	NA
Age-adjusted model	1 [Reference]	1.02 (0.94-1.10)	0.97 (0.90-1.06)	1.09 (1.01-1.18)	1.33 (1.24-1.44)	<.001	1.22 (1.17-1.27)
Multivariate model[b]	1 [Reference]	1.04 (0.96-1.12)	1.03 (0.95-1.12)	1.11 (1.02-1.20)	1.17 (1.08-1.27)	<.001	1.09 (1.04-1.14)
Processed red meat							
Cases/person-years, No.	1294/444 119	1230/421 760	1236/456 687	1204/442 791	1427/442 002	NA	NA
Age-adjusted model	1 [Reference]	1.08 (1.00-1.17)	1.11 (1.03-1.20)	1.14 (1.05-1.23)	1.35 (1.25-1.46)	<.001	1.41 (1.31-1.52)
Multivariate model[b]	1 [Reference]	1.05 (0.97-1.14)	1.08 (1.00-1.17)	1.08 (1.00-1.17)	1.14 (1.05-1.23)	.001	1.14 (1.05-1.24)
Pooled Results[c]							
Total red meat	1 [Reference]	1.05 (0.98-1.12)	1.09 (1.02-1.16)	1.16 (1.08-1.24)	1.19 (1.11-1.28)	<.001	1.10 (1.07-1.13)
Unprocessed red meat	1 [Reference]	1.03 (0.97-1.10)	1.03 (0.96-1.10)	1.09 (1.02-1.16)	1.17 (1.10-1.26)	<.001	1.10 (1.06-1.14)
Processed red meat	1 [Reference]	1.03 (0.97-1.10)	1.08 (1.01-1.15)	1.08 (1.01-1.15)	1.14 (1.07-1.22)	<.001	1.16 (1.09-1.23)

Abbreviations: HR, hazard ratio; NA, not applicable.

[a] Data are given as HR (95% CI) except where indicated otherwise.

[b] The multivariate model was adjusted for age (continuous); body mass index (calculated as weight in kilograms divided by height in meters squared) category (<23.0, 23.0-24.9, 25.0-29.9, 30.0-34.9, or ≥35.0); alcohol consumption (0, 0.1-4.9, 5.0-29.9, and ≥30.0 g/d in men; 0, 0.1-4.9, 5.0-14.9, ≥15.0 g/d in women); physical activity level (<3.0, 3.0-8.9, 9.0-17.9, 18.0-26.9, or ≥27.0 hours of metabolic equivalent tasks per week); smoking status (never, past, or current 1-14 cigarettes per day, current 15-24 cigarettes/d, or current ≥25 cigarettes/d); race (white or nonwhite); menopausal status and hormone use in women (premenopausal, postmenopausal never users, postmenopausal past users, or postmenopausal current users); family history of diabetes mellitus, myocardial infarction, or cancer; history of diabetes mellitus, hypertension, or hypercholesterolemia; and intakes of total energy, whole grains, fruits, and vegetables in all quintiles.

[c] Results from the multivariate model were combined using the random-effects model.

Pan, A. et al. Arch Intern Med 2012;0:archinternmed.2011.2287v1-9.

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Dose-response relationship between red meat intake and risk of all-cause mortality in the Health Professionals Follow-up Study (A) and the Nurses' Health Study (B)

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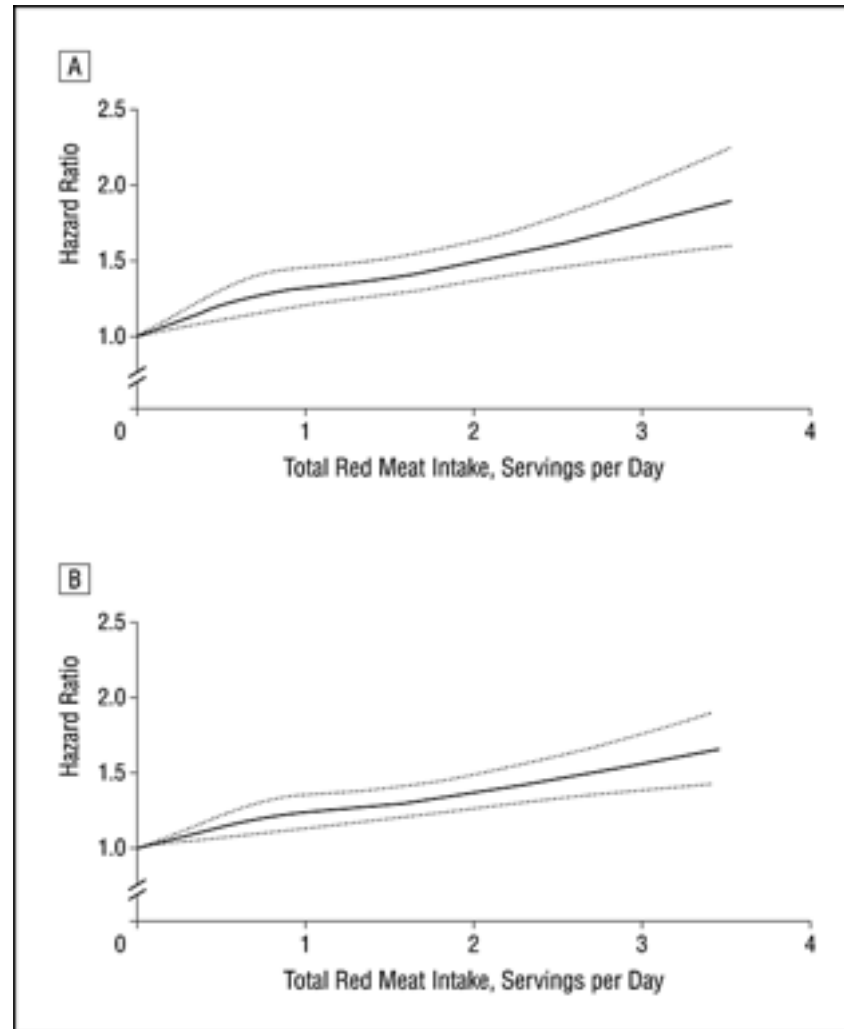
Hazard ratios and 95% CIs (error bars) for total mortality associated with replacement of other food groups for red meat intake
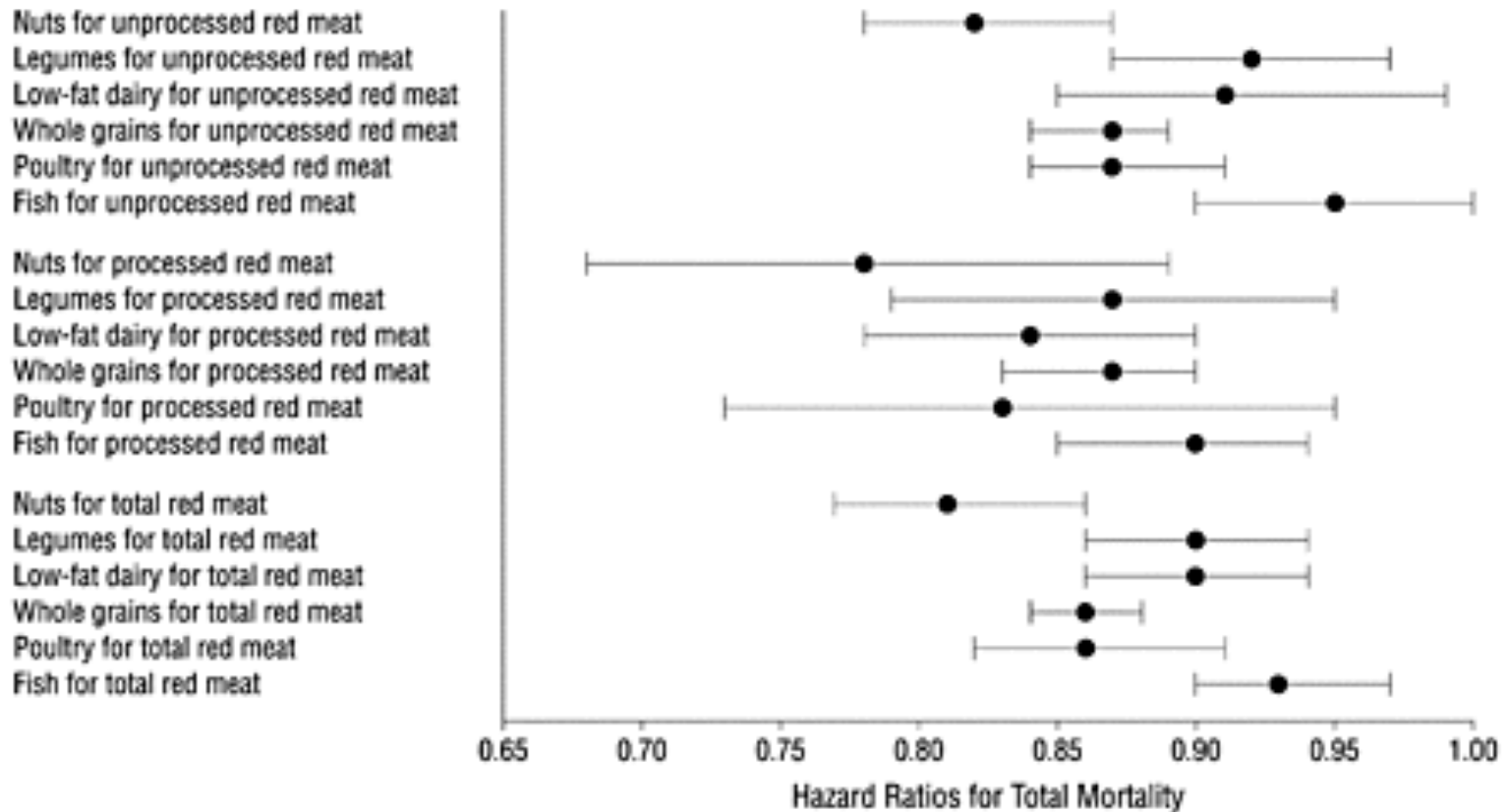
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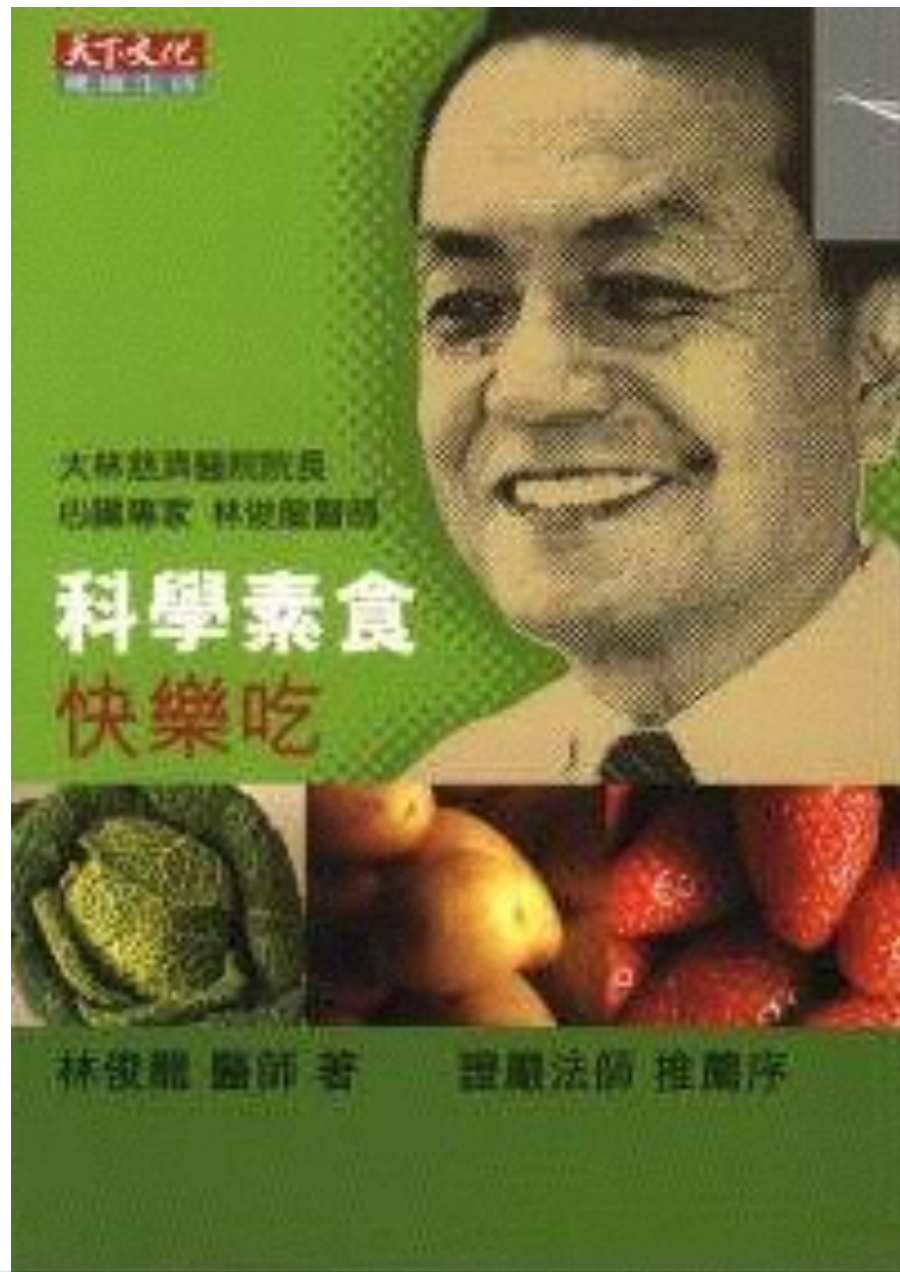
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天下文化
健康生活

冠狀動脈心臟病和二尖瓣脫垂、
是常見的兩大健康殺手。
心臟病權威林俊龍院長
以實例帶您認識這兩種病症、
並提供素食食譜和運動配方，
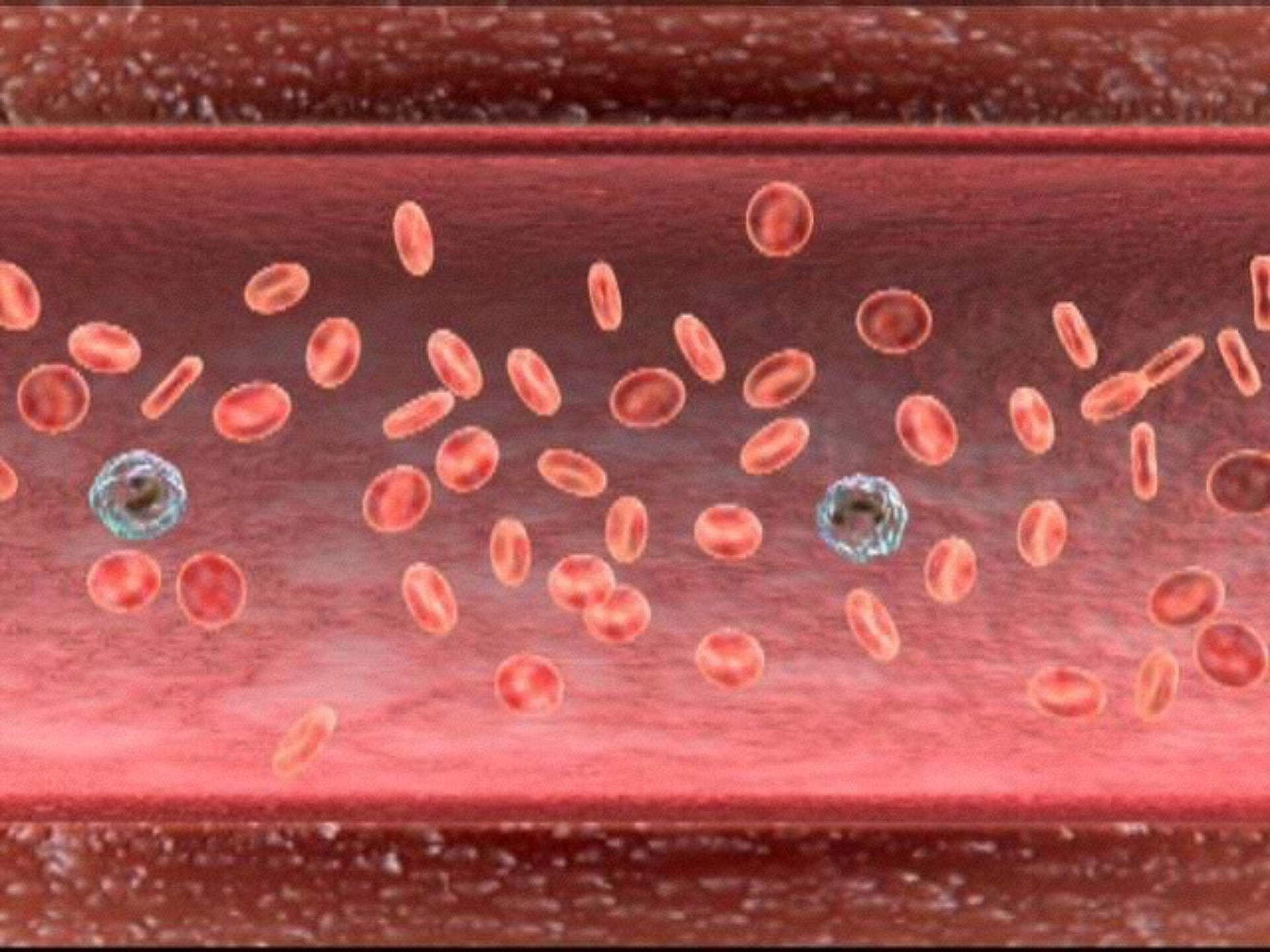讓你遠離心臟病。

吃
心臟好
病

大林慈濟醫院院長
林俊龍 著

天下文化
健康生活

大林慈濟醫院院長
心臟專家 林俊龍醫師

科學素食
快樂吃

林俊龍 醫師 著   證嚴法師 推薦序
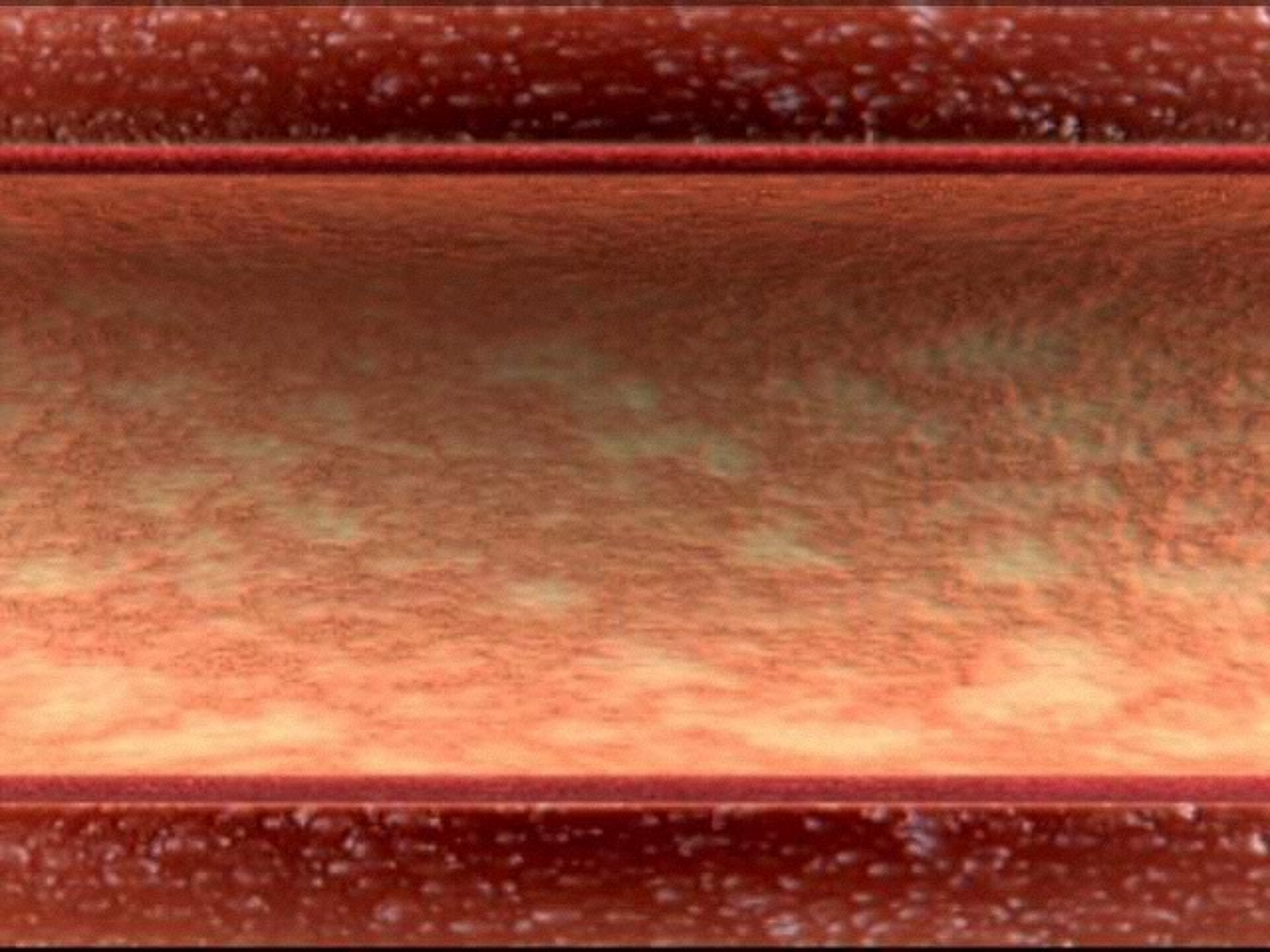
NATURAL HISTORY OF ATHERO-SCLEROTIC DISEASE

(McGill et al., 1963)

| Infarct | Stroke | Gangrene | Aneurysm |

Threshold of Risk for Clinical Events

Complicated lesion: plaque rupture, thrombosis, hemorrhage, calcification

Fibrous plaque

Fatty streak

Normal artery

AGE

70
60
50
40
30
20
10
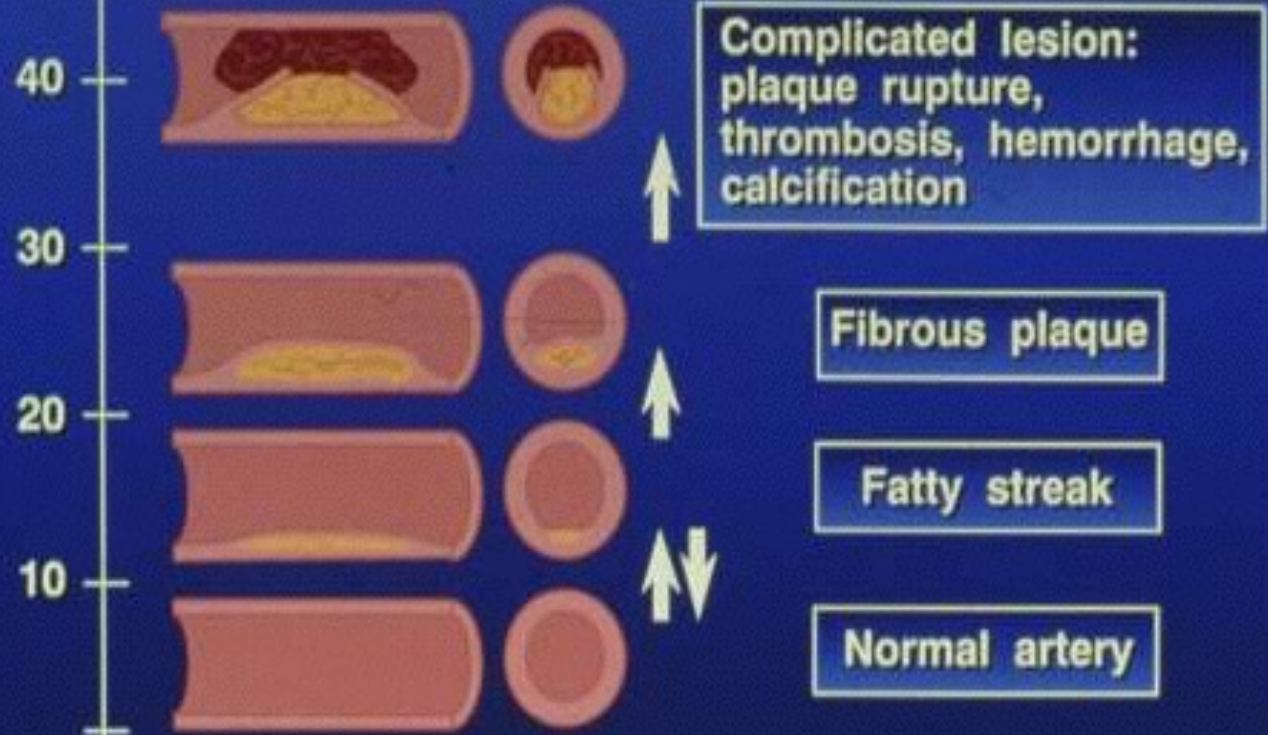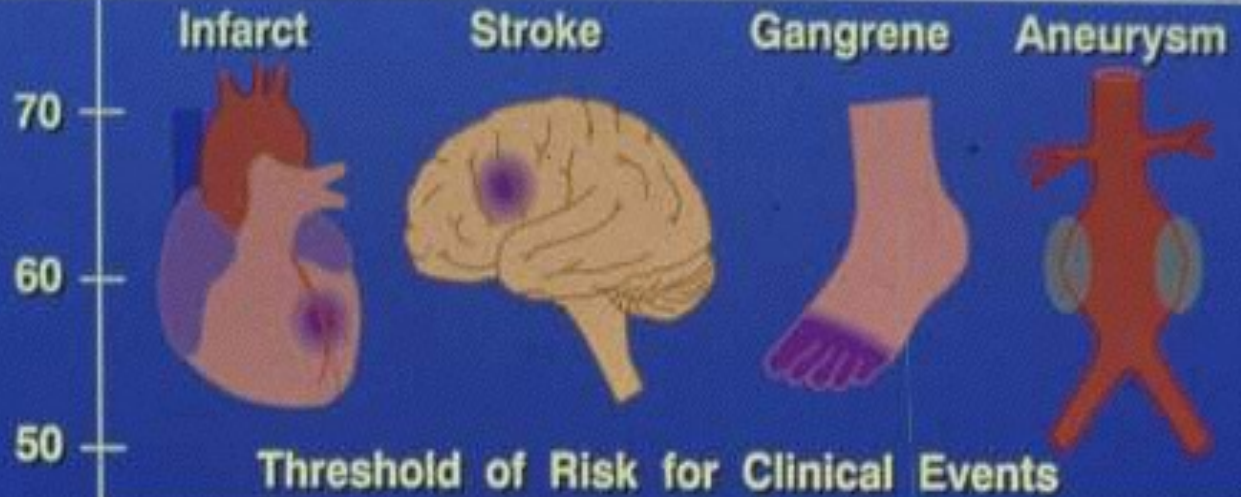
What are the lesions a normal coronary angiogram may conceal?

Normal | Rupture-Prone Vulnerable Plaque | Ruptured / Healing Vulnerable Plaque | Erosion-Prone Vulnerable Plaque | Eroded Vulnerable Plaque | Vulnerable Plaque with Intra-Plaque Hemorrhage | Vulnerable Plaque with Calcified Nodule | Critically Stenotic Vulnerable Plaque
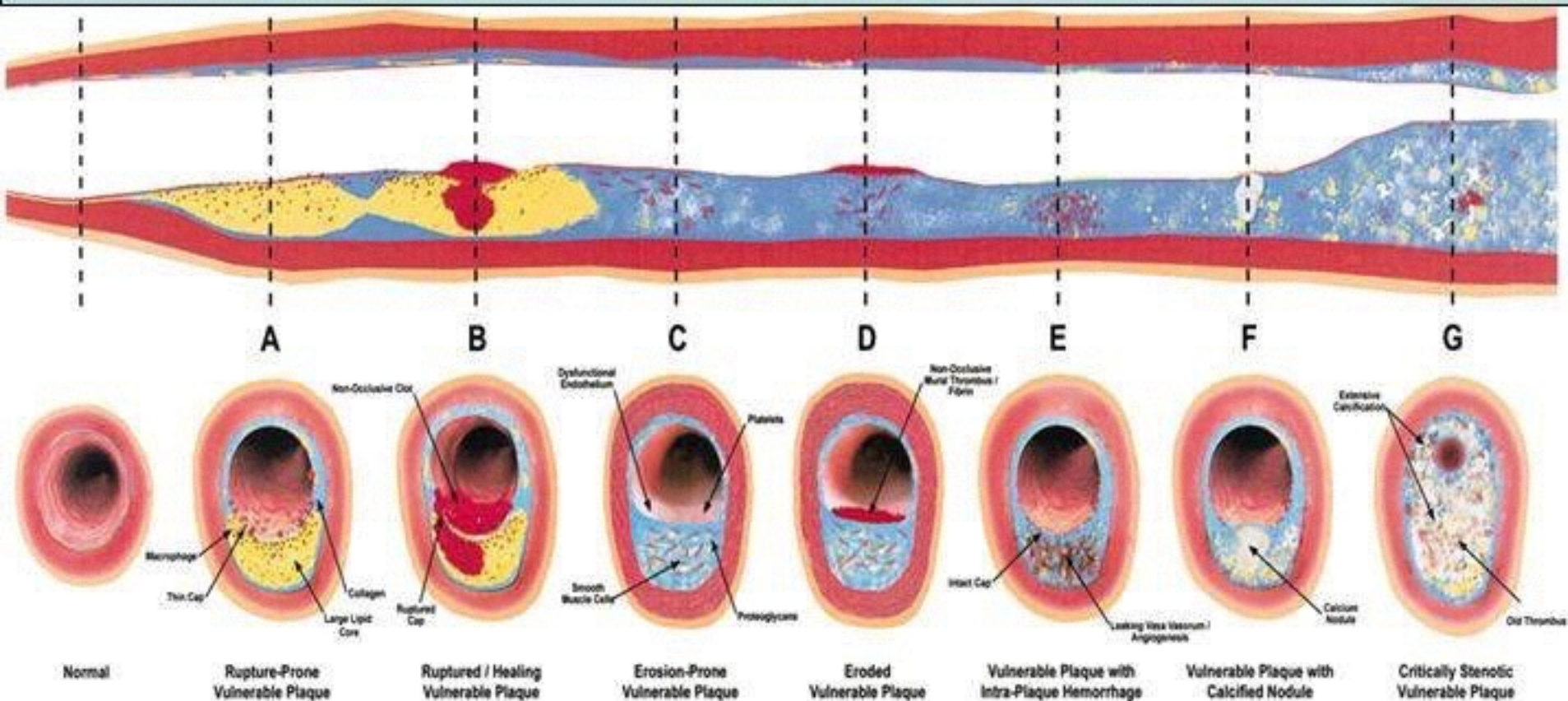
VASCULAR DILATORY FUNCTIONS OF OVO-LACTOVEGETARIANS COMPARED WITH OMNIVORES

Chin-Lon Lin, Te-Chao Fang, Mein-Kai Gueng
Division of Cardiology

Department of Internal Medicine

Buddhist Tzu Chi Dalin General Hospital,

Method

Twenty healthy vegetarians over the age of fifty and 20 healthy omnivores over the age of 50 were recruited for this study.

Subjects with known risk factors for atherosclerosis such as hypertension, diabetes, obesity, hypercholesteremia, cigarette smoking, family history of vascular diseases, or taking any regular medication were excluded.

Method

Medical history, body weight, height, and duration of vegetarian diet were recorded. Baseline CBC, urinalysis and biochemical data such as fasting blood glucose, thyroid function, blood urea nitrogen, creatinine, serum electrolytes (sodium, potassium, chloride, calcium and magnesium)

Method

Lipid profiles [total cholesterol, triglycerides, high density lipoprotein (HDL) cholesterol, low density lipoprotein (LDL) cholesterol] were obtained after a 14 hour fast.

Blood pressures and heart rate were recorded in supine position.
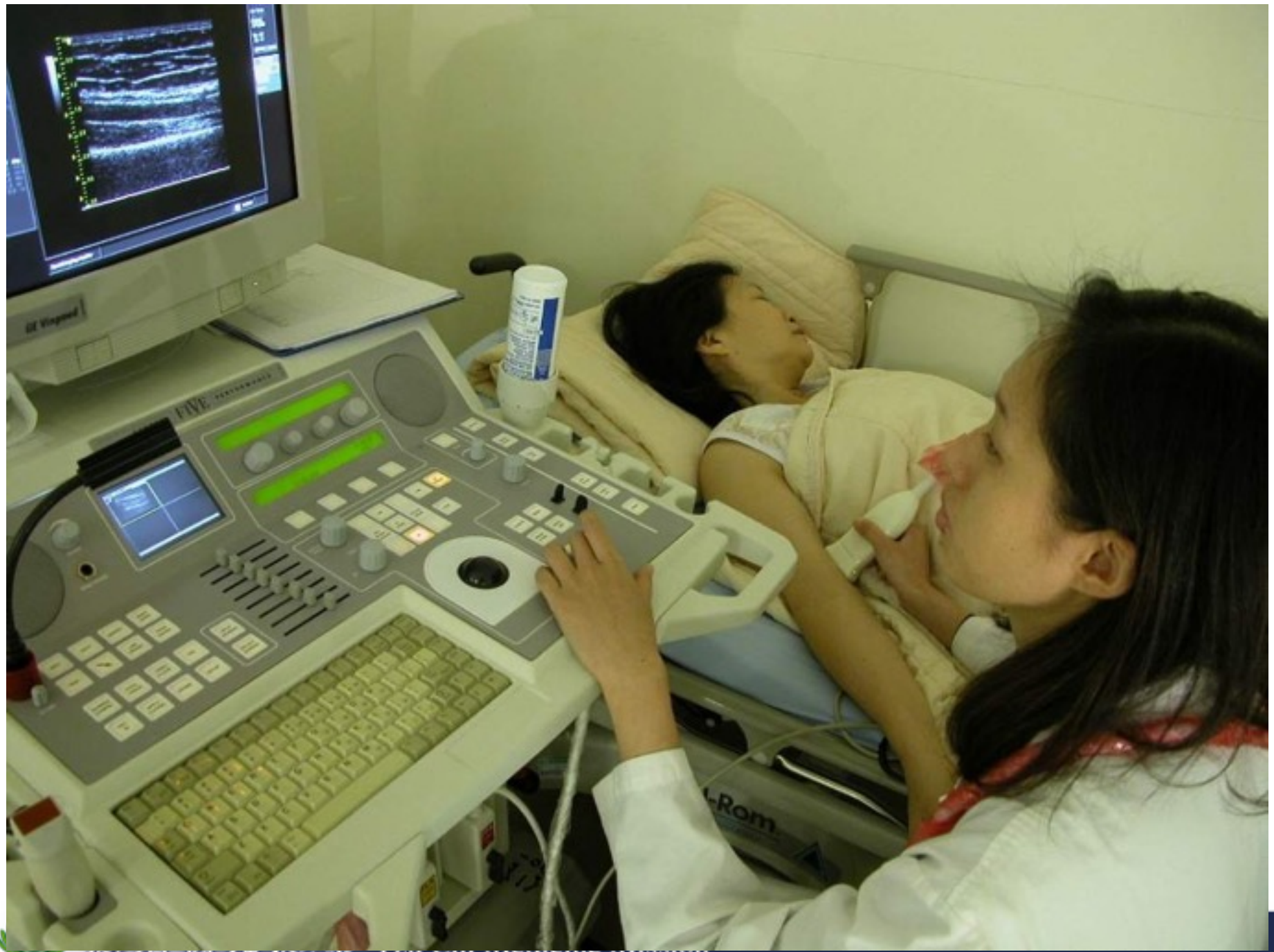
Method

Vascular dilatory functions

A. Flow-mediated (endothelium-dependent)

B. Nitroglycerin-induced (endothelium-independent),

Were evaluated using a non-invasive ultrasonographic method.
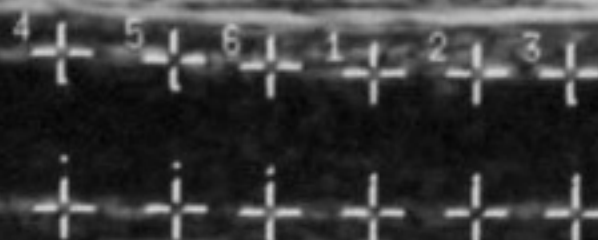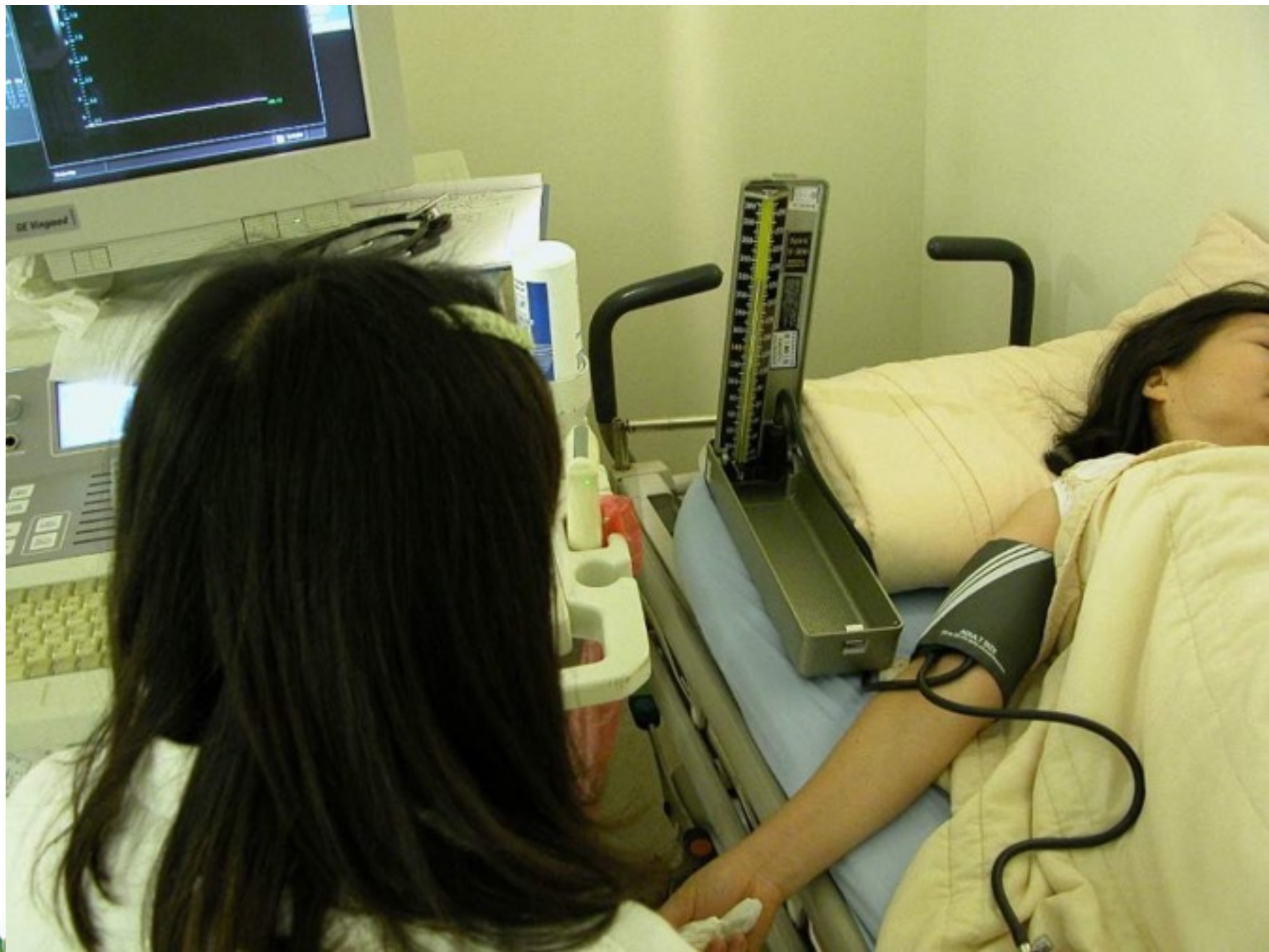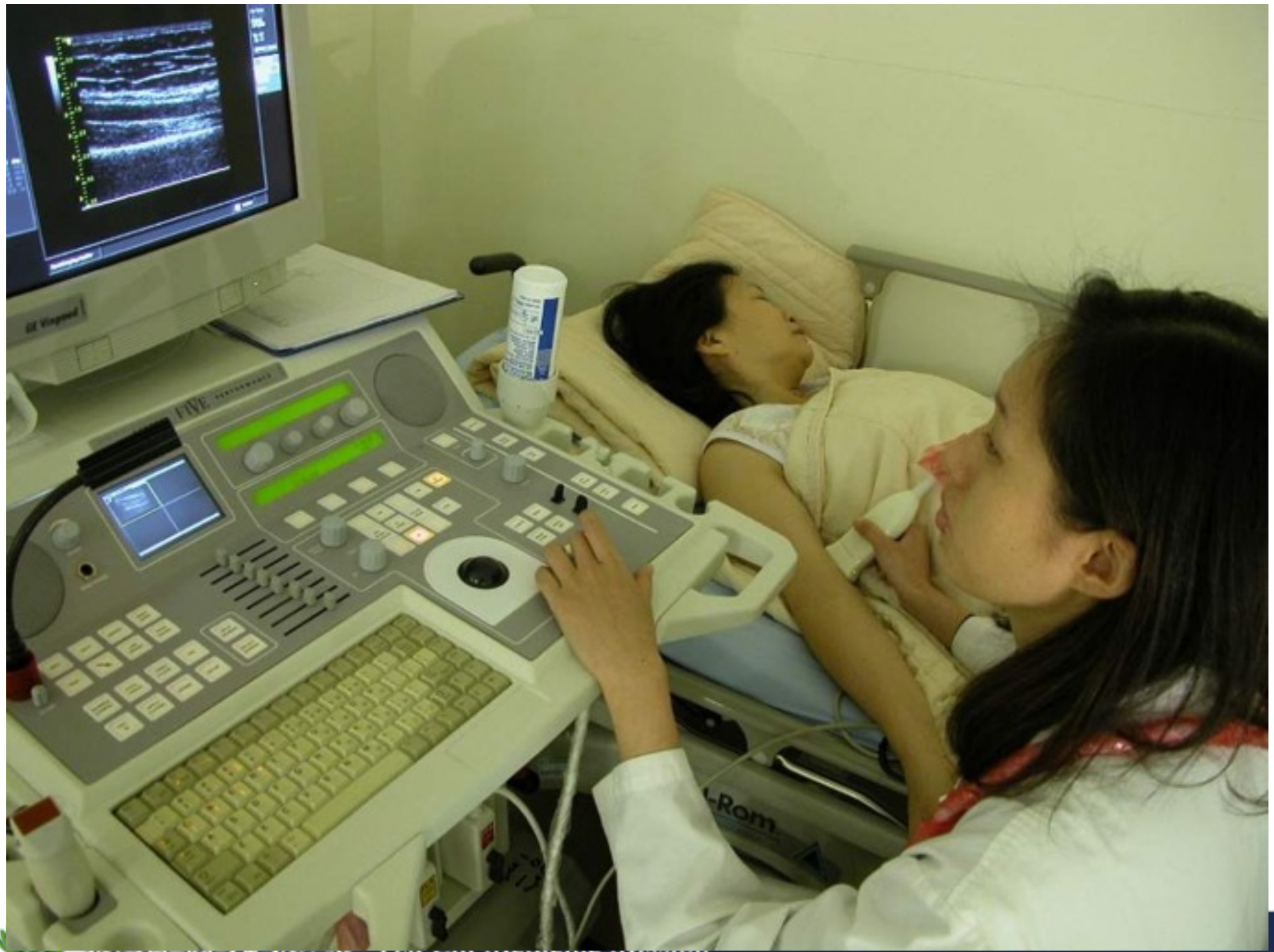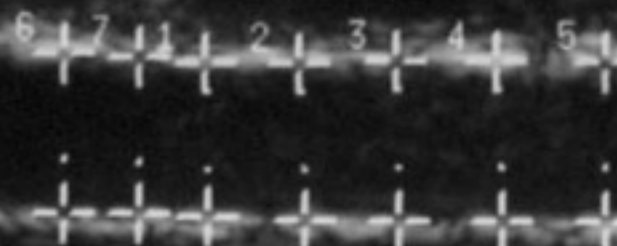
結果 The Results

There was no significant differences in blood pressure, heart rate, or biochemistry

血壓心跳生化檢查無差異

Table 1. Characteristics of both vegetarian and omnivore volunteers.

	Omnivore N=20	Vegetarian N=20	T-test p value
Age, years (mean ±SD)	56.4 ±4.0	58.6 ±3.5	0.073
Body Mass Index (Kg/m^2)	24.8 ±3.1	23.1 ±3.1	0.085
Systolic Blood Pressure (mm Hg)	121 ±8	123 ±15	0.672
Diastolic Blood Pressure (mm Hg)	78 ±8	77 ±9	0.602
Heart Rate (Beats per minute)	66 ±8	65 ±8	0.612
Blood Urea Nitrogen (mg/dL)	11.2 ±2.6	12.4 ±2.4	0.159
Serum Creatinine (mg/dL)	0.9 ±0.2	0.8 ±0.2	0.210
Serum Sodium (mmol/L)	142.4 ±1.6	141.4 ±1.7	0.067
Serum Potassium (mmol/L)	4.3 ±0.4	4.5 ±0.8	0.205
Serum Chloride (mmol/L)	105.7 ±2.0	105.3 ±1.7	0.413
Serum Calcium (mmol/L)	2.2 ±0.1	2.2 ±0.1	0.726
Serum Magnesium (mmol/L)	2.2 ±0.3	2.2 ±0.2	0.823

Abbreviations: SD, standard deviation.

Table 2. Blood biochemistry and thyroid function of vegetarian and omnivore

	Omnivore N=20	Vegetarian N=20	*p*-value
Glucose (mg/dL)	98 ±14	87 ±8	0.655
Total Cholesterol (mg/dL)	166 ±36	162 ±32	0.694
LDL Cholesterol (mg/dL)	120 ±30	116 ±29	0.617
HDL Cholesterol (mg/dL)	46 ±17	48 ±8	0.664
Triglycerides (mg/dL)	100 ±51	94 ±33	0.655
T_3 (ng/dL)	118 ±28	116 ±23	0.816
T_4 (*u*g/dL)	8.3 ±1.4	8.3 ±1.7	0.864
TSH (*u*IU/mL)	1.5 ±0.9	1.4 ±0.6	0.693

All values are expressed as mean ± standard deviation. Abbreviations: LDL, low

density lipoprotein; HDL, high density lipoprotein; T3, triiodo-L-thyronine; T4,

L-thyroxine; TSH, thyroid-stimulating hormone.

Table 3. Vasodilatory functions of brachial artery evaluated by ultrasonography in omnivores and vegetarians.

	Omnivore N=20	Vegetarian N=20	*p*-value
Baseline vessel size (mm)	4.42 ±0.53	4.21 ±0.55	0.2071
Flow-mediated dilatation (%)	3.13 ±1.36	13.78 ±2.54	<0.001
NTG-induced dilatation (%)	13.78 ±2.06	21.99 ±2.21	<0.001

All values are expressed as mean ± standard deviation.

結論 Conclusion

素食者內皮細胞功能較葷食者好
The endothelial function is far better in vegetarians

素食越久內皮細胞功能越好
The longer being on vegetarian diet, the better
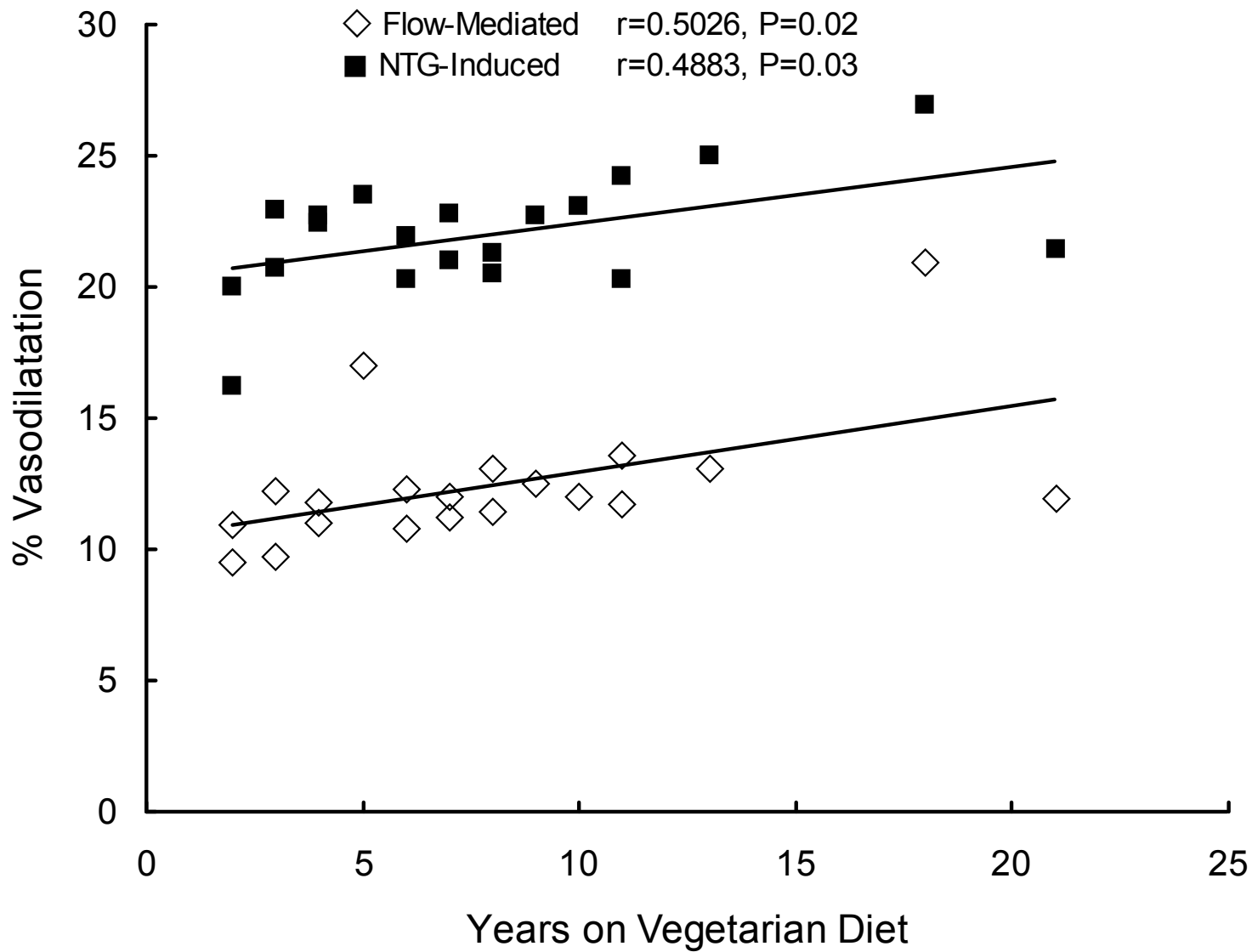
Insulin Sensitivity in Ovo-lactovegetarians compared with Omnivores

Chin-Sung Kuo, Ning-Sheng Lai, Low-Tone Ho, Chin-Lon Lin.

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Methods-1

The study included 36 healthy volunteers (vegetarian, *n*=19; omnivore, *n*=17) who had normal fasting plasma glucose level. Each participant completed an insulin suppression test.

Results-2

- **SSPG: 105.4 ± 10.2 vs 80.3 ± 11.3, *p*<0.001**
- **Fasting insulin: 4.06 ± 0.77 vs 3.02 ± 1.19 μU/ml, *p*=0.004**
- **HOMA-IR: 6.75 ± 1.31 vs 4.78 ± 2.07, *p*=0.002**
- **HOMA %S: 159.2 ± 31.7 vs 264.3 ± 171.7 %, *p*=0.018**

Results-3

- **In addition, We found a good linear relationship between years on vegetarian diet and SSPG (r=-0.541, p=0.017).**
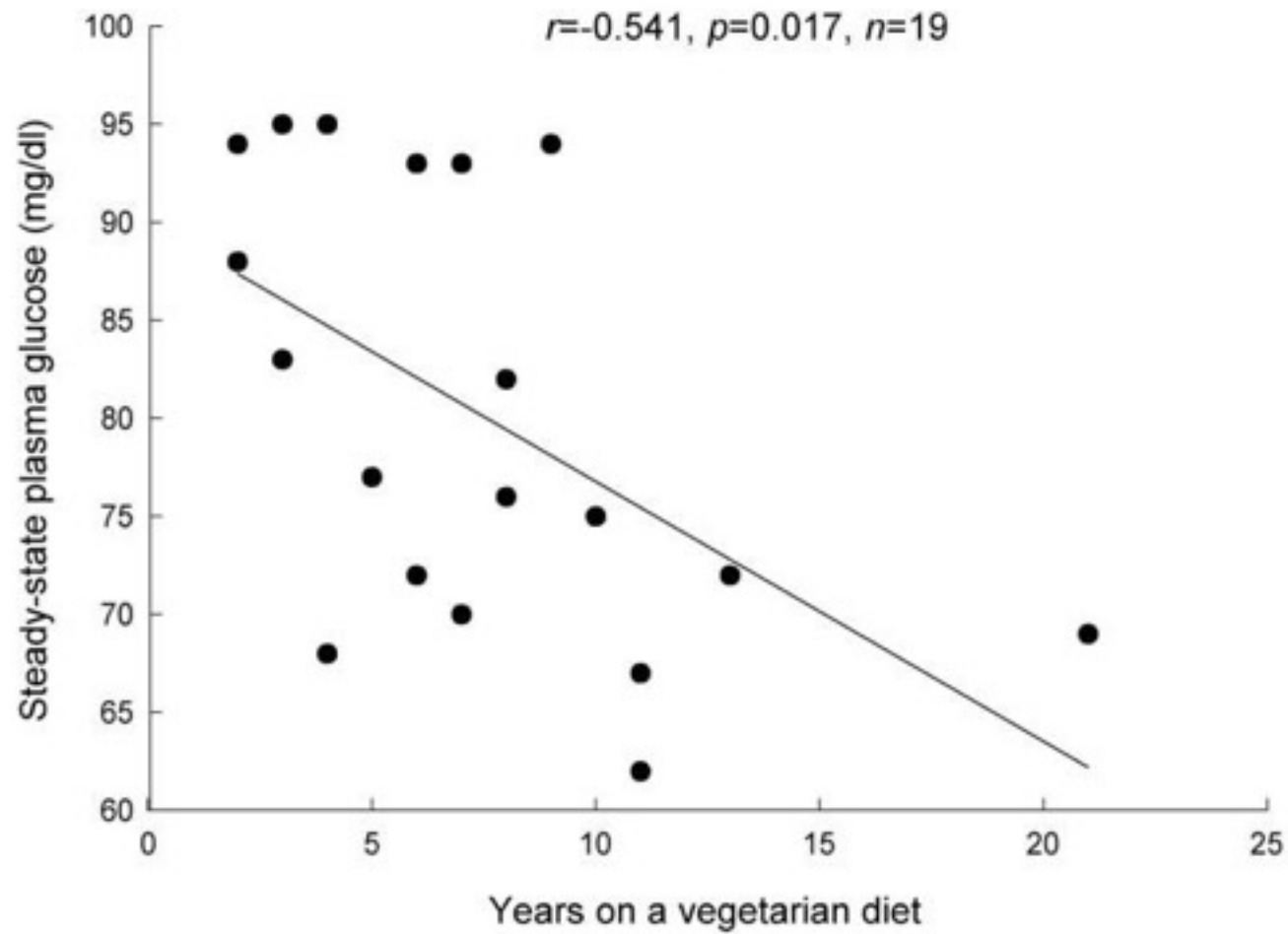
Conclusions

The vegetarians are more insulin sensitive than the omnivores

Taiwanese Vegetarians and Omnivores: Dietary Composition, Prevalence of Diabetes and IFG

Tina H. T. Chiu[1,2], Hui-Ya Huang[3], Yen-Feng Chiu[4], Wen-Harn Pan[2,5], Hui-Yi Kao[4], Jason P. C. Chiu[6], Ming-Nan Lin[3,7]*, Chin-Lon Lin[1,8,9]

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Abstract

Introduction: Vegetarian diets have been shown to improve glucose metabolism and reduce risk for diabetes in Westerners but whether Chinese vegetarian diets have the same benefits is unknown.

Methods: We evaluated the association between diet and diabetes/impaired fasting glucose (IFG) among 4384 Taiwanese Buddhist volunteers and identified diabetes/IFG cases from a comprehensive review of medical history and fasting plasma glucose.

Results: Vegetarians had higher intakes of carbohydrates, fiber, calcium, magnesium, total and non-heme iron, folate, vitamin A, and lower intakes of saturated fat, cholesterol, and vitamin B12. Besides avoiding meat and fish, vegetarians had higher intakes of soy products, vegetables, whole grains, but similar intakes of dairy and fruits, compared with omnivores. The crude prevalence of diabetes in vegetarians versus omnivores is 0.6% versus 2.3% in pre-menopausal women, 2.8% versus 10% in menopausal women, and 4.3% versus 8.1% in men. Polytomous logistic regression adjusting for age, body

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Conclusion: We found a strong protective association between Taiwanese vegetarian diet and diabetes/IFG, after controlling for various potential confounders and risk factors.

Our Conclusions

The vegetarians have 50% (men) and 25 % (women) chances of developing diabetes as compared with omnivores

Total Cardiovascular Risk Profile of Taiwanese Vegetarians

By

Chih-Wei Chen[a, b], Ying-Lung Lin[c], Tin-Kwang Lin[a], Chih-Ta Lin[a], Bin-Chen Chen[a], Chin-Lon Lin[a, b]

慈濟醫療志業 Tzu Chi Medicine Mission

Methods

One hundred ninety eight healthy subjects (99 vegetarians and 99 omnivores) were recruited.

Fasting blood samples were analyzed for glucose, cholesterol, triglyceride, HDL-C, LDL-C, white blood cell count, hs-CRP, and homocysteine.

Table 3A Baseline characteristics and results for male subjects

	Vegetarians Mean ± S.D.	Omnivores Mean ± S.D.	P value
Number	34	53	
Age [a] (years)	50.88 ± 9.33	49.25 ± 10.51	0.461
Body Weight(kg)[a]	67.10 ± 13.16	69.61 ± 11.19	0.345
Body Height(cm) [a]	166.68 ± 7.13	167.75 ± 5.96	0.448
BMI [a](kg/m^2)	24.00 ± 3.53	24.67 ± 3.44	0.385
Smoke [b]			
Yes	11 (32.4)	21 (39.6)	0.493
No	23 (67.6)	32 (60.4)	
SBP [a](mmHg)	123.15 ± 16.30	126.89 ± 15.23	0.288
DBP [a](mmHg)	79.71 ± 9.67	81.43 ± 12.03	0.462
UA [a](mg/dL)	6.42 ± 1.23	6.22 ± 1.35	0.471
Cholesterol [a](mg/dL)	183.85 ± 33.63	201.36 ± 37.28	0.029 *
Triglyceride [c](mg/dL)	127.62 ± 87.46	127.00 ± 97.8	0.744
HDL-C [a](mg/dL)	47.97 ± 17.52	49.32 ± 11.86	0.669
LDL-C [a](mg/dL)	120.44 ± 28.94	138.98 ± 35.74	0.013 *
Glucose [a](mg/dL)	90.09 ± 7.60	91.53 ± 20.73	0.647
WBC [a](10^3/μL)	6.73 ± 1.35	6.75 ± 1.59	0.941
hs-CRP [c](mg/dL)	0.12 ± 0.18	0.24 ± 0.43	0.087
Homocysteine [c](μmol/L)	15.00 ± 9.74	9.82 ± 2.40	0.001 *

Conclusions

- **Taiwanese vegetarians have lower total cholesterol, LDL-C, and hs-CRP levels, and higher homocysteine levels than omnivores.**

- **Taiwanese vegetarians had a better cardiovascular risk profile than omnivores, due to different predictive value of each risk factor,**

Healthy diets (low meat and high intake of fruits, vegetables, and whole-grain bread), had a BMI less than 30, and had at least 30 minutes / day of physical activity

78% lower overall risk of chronic diseases

93% reduced risk of diabetes

81% lower risk of myocardial infarction

50% reduction in risk of stroke

36% overall reduction in risk of cancer

Ornish D, Scherwitz LW, Billings JH; et al. Intensive lifestyle changes for reversal of coronary heart disease. JAMA. 1998;280(23):2001-2007

Article

Cyanobacterial Neurotoxin β-*N*-Methylamino-L-alanine (BMAA) in Shark Fins

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Abstract: Sharks are among the most threatened groups of marine species. Populations are declining globally to support the growing demand for shark fin soup. Sharks are known to bioaccumulate toxins that may pose health risks to consumers of shark products. The feeding habits of sharks are varied, including fish, mammals, crustaceans and plankton. The cyanobacterial neurotoxin β-*N*-methylamino-L-alanine (BMAA) has been detected in species of free-living marine cyanobacteria and may bioaccumulate in the marine food web. In this study, we sampled fin clips from seven different species of sharks in South Florida to survey the occurrence of BMAA using HPLC-FD and Triple Quadrupole LC/MS/MS methods. BMAA was detected in the fins of all species examined with concentrations ranging from 144 to 1836 ng/mg wet weight. Since BMAA has been linked to neurodegenerative diseases, these results may have important relevance to human health. We suggest that consumption of shark fins may increase the risk for human exposure to the cyanobacterial neurotoxin BMAA.

Shark fin with neurotoxins

心靈
Soul

Food

justin ebert

Butchering Vs. Eating Animal Flesh

Butchers who have to kill animals, experience fear and guilt from their acts, such that they sing the following song before slaughtering, in an effort to shed guilt:

Piggy, Piggy, please don't blame me!
You are a dish for humankind!
He doesn't eat, I don't kill.
To revenge – go to those who eat meat!

To care with compassion
To give with joy

No killing is the starting point

Copyright 2001 Frantisek Staud

Eye for Eye, Blood for Blood

Plant based diet for the soul

There is still a holocaust going on – just ask the cows (100,000/day killed in the USA) or pigs (250,000/day) or chickens (15,000,000/day). The healthier are our nonhuman animals, the healthier are the human ones. We kill them, and then, they kill us!

~ William C. Roberts, MD,

Editor, *American Journal of Cardiology*

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"THERE IS MORE HAPPINESS IN GIVING THAN IN RECEIVING"
(According to Paul/Luke, Acts 20,35, a saying of Jesus)

施比受更有福

From Father Luis Gutheinz

(May 17, 2004)

慈濟醫療服務站

人醫會

台北慈院
義診團

TIMA

Tzu Chi International Medical Association

Over 30 countries around the globe

Conclusion

1. **It's feasible to provide delicious and nutritionally adequate plant-based menus.**
2. **The patient, family and staff's acceptance has been very high**
3. **Reduce climate footprint and support food access and nutrition**
4. **Help in the prevention and treatment of diseases.**
5. **Plant-based diets are good for planet earth, health and soul**

Healthy diets (low meat and high intake of fruits, vegetables, and whole-grain bread), had a BMI less than 30, and had at least 30 minutes / day of physical activity

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Plant based diet for the soul

- **Non-killing, compassion, peace of mind**
- **"God said, 'Behold, I have given you every seed bearing plant on the face of the earth, and every tree that has seed bearing fruit. It shall be to you for food." Genesis 1:29**

Plant based diet for the soul

There is still a holocaust going on – just ask the cows (100,000/day killed in the USA) or pigs (250,000/day) or chickens (15,000,000/day). The healthier are our nonhuman animals, the healthier are the human ones. We kill them, and then, they kill us!

~ William C. Roberts, MD, Editor, *American Journal of Cardiology*

Steve Jobs

Stay Hungry
Stay Foolish
Stay Vege

Conclusion
Plant-based diet is good for

1. **Earth** 地球
2. **Health** 健康
3. **Soul** 心靈

Thank You

The End