授課講師學經歷

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課程名稱（主題）	素食飲食之減重效應
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授課內容摘要

體重過重、肥胖會帶給身體一定的傷害，例如糖尿病、高血壓、冠狀動脈硬化等相關疾病，除了身體健康造成危害，對於心理上也容易產生自俾感及社交問題，所以減重一直適非常熱門的話題。

減重的方式包含有行為的改變、規律的運動習慣，以及低熱量的飲食攝取。關於低熱量的飲食攝取中，除了降低熱量的攝取外，通常會以增加膳食纖維的量來提高飽足感，而素食的飲食方式是否是一種有利於減重的飲食方法。

依據『2003年台灣地區食品調查統計年鑑』，國內約有10%的素食人口，其中女性素食者佔的人口比率為13.2%，男性素食者占人口比率為6.8%。近年來茹素族群似乎不再以宗教信仰為主要因素，而是著重於健康的意識及環保的觀念，相同的狀況亦發生在歐美地區。

這次的課程內容就是以國外對於素食飲食減重效益的相關研究為主題，並且比較國內素食與國外素食的異同與大家分享。

素食飲食的減重效應

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Outline

- 前言-Overweight and obesity
- 不同飲食方式與BMI之關係
- 素食名詞介紹
- 素食的益處
- 素食與非素食的比較
  - 生活型態相似之族群
  - 不同國家的研究調查
- 臨床試驗（Clinical Trial）
  - Uncontrolled
  - Controlled
- 機制（Mechanisms）
- 結論
- 參考文獻（References）

前言-Overweight and obesity

- Overweight and obesity are increasing not only in the United States,but also globally.

Office of the Surgeon General,*2000*
WHO,1998

- 64% →overweight(BMI≥25.0 kg/m²)
  30% →obese (BMI≥30.0 kg/m²).
- 8% increase in overweight
  7% increase in obesity
  (from 1988–1994 NHANES)

NHANES, 1999–2000

National Health and Nutrition Examination Survey (NHANES)
The World Health Organization (WHO)

前言-Overweight and obesity

- WHO: 1.2 billion→ overweight or obese
  numbers are rapidly increasing

WHO,1998

- health problems : hypertension
  diabetes
  osteoarthritis
  coronary heart disease
  certain cancers

The World Health Organization (WHO)

不同飲食方式與BMI之關係

- CARDIA: dietary ⟺ health
  - 5,115 young adults
  - lower BMIs : eating red meat and poultry
    頻率:一週少於1次

Slattery et al., 1991

- California SDAs:cohort
  - 34,192 ; 6 years
  - higher BMIs:consumed meat more frequently

Fraser et al., 1999

The Coronary Artery Risk Development in Young Adults (CARDIA)

不同飲食方式與BMI之關係

- EPIC: BMI ⟺ meat consumption
  - highest →meat eaters
    intermediate → fish eaters and ovo-lactovegetarians
    lowest→ vegans.
  - male :meat eaters > vegans →5.9kg
    female :meat eaters > vegans →4.7kg

Key et al., 1996
Spencer et al., 2003

European Prospective Investigation into Cancer and Nutrition (EPIC)

不同飲食方式與BMI之關係

- BMI:
  meat eaters>ovo-lacto- vegetarians>vegans
- BMI:1 kg/m^2

Key et al., 1999
Thorogood et al., 1994
Frentzel-Beymw et al., 1994
Snowdon et al., 1984
Chang-Claude et al., 1993

- Time
  lower BMI: length of time on a vegetarian diet

Spencer et al., 2003
Key et al., 1996

素食名詞介紹

- Vegetarian diets
  based on plant-derived foods
  such as grains, beans, fruits, and vegetables
- Ovo-lacto-vegetarians(蛋奶素)
  avoid meats but consume dairy products and eggs
- Vegan diet(全素)
  avoid all food products of animal origin

素食的益處

- lower body weight

Key et al., 1999
Dwyer et al., 1988
Dwyer et al., 1991
Sabate et al., 2003

- other health benefits:
  - improved control of blood lipids, blood pressure, diabetes
  - reversal of cardiac atherosclerosis
  - reduced incidence of certain cancers

Ornish et al., 1996
Barnard et al., 2000
Berkow et al., 2005
Nicholson et al., 1999
Jenkins et al., 2003
Ornish et al., 1990
Thorogood et al., 1994
Frentzel-Beymw et al., 1994

素食與非素食的比較

- 40(29):BMI/body weight
  →vegetarians < non-vegetarians
  - 性別
  - 人種:
    African Americans, Nigerians, Caucasians, Asians
  - 地區

	weight	BMI
female	2.9~10.6kg (6~17%)	2.7~15%
male	4.6~12.6kg (8~17%)	4.6~16.3%

Susan et al., 2006

生活型態相似族群之比較

Seventh-Day Adventists(SDA)

- avoid tobacco, caffeine, and alcohol
- half follow vegetarian diets,
  half consume a moderate amount of meat products

生活型態相似族群之比較

		BMI(kg/m^2)	Weight(kg)
Melbe	female	4.2 ($p<0.0001$)	-
	male	1.8	-
Rouse	female	1.8~2.2($p<0.01$)	3.6~7.9 ($p<0.01$)
	male	1.1~3.0 ($p<0.01$)	6.3~8.5 ($p<0.01$)
Fraser	female	-	5.5 ($p<0.0001$)
	male	-	6.4 ($p<0.0001$)
Nieman	female	-	2.5 ($p=0.13$)

- Melby et al., 1985:SDA veg V.S SDA non-veg
- Rouse et al., 1983:SDA veg V.S Mormon non-veg
- Fraser et al., 2000:SDA veg V.S SDA non-veg
- Nieman et al., 1989:37 elderly female SDA veg V.S SDA non-veg

生活型態相似族群之比較

	BMI(kg/m²)		
	vegetarians	non-vegetarians	*p*
female	22.3	23.7	<0.001
male	22.1	24.6	<0.01

- Burr et al., 1981
  - patrons of health food shops
  - interest in healthy living.

不同國家的研究調查

- Dutch(荷蘭)
  - 183 men
  - non-vegetarians V.S ovo-lacto-vegetarians , macrobiotic
  - lower weights and BMI :ovo-lacto-vegetarians macrobiotic

Knuiman et al., 1982

- African-American(非裔美國人)
  - 45 vegans V.S 143 ovo-lacto-vegetarians
  - vegans: lower weights

Toohey et al., 1998

不同國家的研究調查

- UK Women's Cohort Study (香港)
  - 33,971 ; well-educated women (mean age 52±9 years)
  - low BMIs
  - obesity:10%
  - obesity in the vegetarian : 5% to 6%

Greenwood et al., 2000

不同國家的研究調查

- United Kingdom(英國)
  - Excluded:cardiovascular, heart disease, hypertension, diabetes, high cholesterol, or cancer.
  - obesity in vegetarians: 2%
  - obesity in in meat eaters : 5%

Spencer et al., 2003

- Swedish(瑞典)
  - 55,459 women
  - obesity in omnivores:40%
  - obesity in semi-vegetarians and vegans:29%
  - obesity in ovo-lacto vegetarians:25%

Newby et al., 2005

Uncontrolled Clinical Trial-(1)

- subject
  - 500 men and women
  - 5% fat vegan diet for 12 days
  - included intensive stress reduction and exercise intervention
- Resulted
  - body weight: ↓0.96%~2.26%
    (men ↓2.5 kg; women ↓1 kg)

McDougall et al., 1995

Uncontrolled Clinical Trial-(2)

- subject
  - 29 hypertensive patients
  - on a vegan diet
  - The patients were not encouraged to undertake regular fitness training.
- Result(after 1 year)
  - body weight↓ 8.2 kg (P<0.001)

Lindahl et al., 1984

Randomized, Controlled Trials-(1)

- 討論心血管疾病的患者，經由飲食及生活型態的介入，是否對體重會產生影響
- Subject-心血管疾病
  - 實驗組:low-fat vegetarian diet
    stopping smoking
    stress management training
    moderate exercise
  - 對照組: usual-care
    physician

Ornish et al., 1990
Barnard et al., 2000

Randomized, Controlled Trials-(1)

- result
  - 一年後，實驗組:BW ↓ 10.76 kg
    對照組:BW ↑ 1.44 kg
  - 五年後，實驗組維持 5.74kg 的體重減輕

Ornish et al., 1990
Barnard et al., 2000

Randomized, Controlled Trials-(2)

- 討論第二型糖尿病患是否因飲食的介入而影響體重的變化
- subject-糖尿病
  - 實驗組:a 10% fat vegetarian diet
  - 對照組:ADA guideline
- Result(12週後)
  - 實驗組: ↓ 7.2 kg
  - 對照組: ↓ 3.8 kg (*p<0.005)*

Nicholson et al., 1999

Randomized, Controlled Trials-(3)

- 討論更年期體重過重的婦女，飲食的介入是否會造成體重的變化
- Subject- 64位體重過重的更年期婦女
  - 實驗組:a low fat vegan diet
    (fat-10%;protein-15%;carbohydrate-75%)
  - 對照組:NCEP guidelines
    (total fat ≤ 30%, saturated fat ≤7%, protein approximately 15%, carbohydrate >55% of energy; cholesterol <200 mg/day)
- Result(After 14 weeks)
  - 實驗組: BW ↓ 5.8± 3.2 kg
  - 對照組: BW ↓ 3.8±2.8 kg (*P*=0.012)

Barnard et al., 2005

National Cholesterol Education Program guidelines(NCEP)

Randomized, Controlled Trials(4)

- a crossover trial :
  - 35 women (mean BMI=25.5±5.2)
  - not to change their exercise habits, a low-fat
- result (6週後)
  - vegan diet without exercise :
    ↓ body weight of 2.5 kg (*P*< 0.001)
    ↓ BMI of 0.9 (*P* < 0.001)
  - baseline BMI>22 : ↓ 3.0 kg
    BMI<22 : ↓ 1.4 kg

Barnard et al., 2000

MECHANISMS

- Population studies :
  higher→carbohydrate and dietary fiber,
  polyunsaturated fat/saturated fat
  lower→ energy, protein, total fat,
  cholesterol, and saturated fat

Haddad et al., 2003
Davey et al., 2003

MECHANISMS

- controlled trials:
  vegetarian and vegan diets tend to:
  - ↓energy, fat, saturated fat, protein, cholesterol
  - ↑ carbohydrate and fiber

Barnard et al., 2005
Turner-McGrievy et al., 2004

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Total Energy

- Energy intake:
  - vegetarians<non-vegetarians

Sabate et al., 2003
Kennedy et al., 2000

  - vegans and vegetarians <non-vegetarians
    5% ~22%

Kennedy et al., 2000
Spencer et al., 2003

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Total Energy

- 素食者
  - 飲食上會減少熱量的攝取

Barnard et al.,2005
Turner-McGrievy et al.,2004
Phillips et al.,2004

  - 不限制熱量及份量，而採用low-fat vegan diet，體重仍會有明顯的下降。

Barnard et al.,2005
Phillips et al.,2004

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Fiber

- vegetarian diets: ↓energy intake
  - higher fiber
  - higher carbohydrate
  - lower fat

Larsson et al., 2002
Haddad et al., 2003

- The EPIC-Oxford study
  - 5292 persons, age:20~89
  - Dietary fiber: body-weight
    men: ↓3.6Kg
    women : ↓ 2.7 kg

Applebyet al., 1996

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Fiber

- fiber intake :
  - 41% higher in vegan than in meat-eating (men)
  - 36% higher in vegan than in meat-eating(women)

Davey et al., 2003

- 臨床試驗:
  - additional 14 g/d fiber →
    - energy intake ↓10%
    - ↓body weight 1.9 kg over 3.8 months

Howarth et al., 2001

- satiety →reduces energy density
  insulin control → influences lean body weight

Howarth et al., 2001
Rolls et al., 2004

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Carbohydrates

- high carbohydrates are associated more closely with lower BMIs

Kennedy et al., 2000
Davey et al., 2003

- higher-carbohydrate diets:
  low energy density of the foods
  - more food weight
  - less total energy

Kennedy et al., 2000

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Carbohydrates

- vegetarian diets:
  >50% energy from carbohydrate

Larsson et al., 2002
Haddad et al., 2003

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Fat

- CSFII 1994–1996and other studies:
  vegetarians →lower total and saturated fat

Kennedy et al., 2000
Appleby et al., 1999

- polyunsaturated fat /saturated fat
  vegan and vegetarian>non-vegetarian diet

Data from the Continuing Survey of Food Intakes by Individuals (CSFII 1994–1996)

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Fat

- polyunsaturated fat /saturated fat
  vegan and vegetarian>non-vegetarian diet

Fraser et al., 1999
Appleby et al., 1999

- inverse association
  polyunsaturated fat in the diet and BMI
- Mechanism unclear

Spencer et al., 2003

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Protein

- Protein was correlated positively with BMI
  - EPIC-Oxford cohort
  - EPIC- Greece cohort

Appleby et al., 1998
Spencer et al., 2003

- protein provided :
  vegetarian<non-vegetarian diet
- all essential and nonessential amino acids can be supplied by plant sources

American et al., 1997

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Protein

- down regulation of insulin & up-regulation of glucagon: non-essential A.A
  - animal protein: releasing insulin
  - plant proteins: impact on glucagon
    -----> body weight & vegan diets

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Health Benefits

- weight and BMI
  vegetarians<non-vegetarians:3% to 20%
- Obesity prevalence
  vegetarians:0% to 6%
  non-vegetarians:5% to 45%
- thermic effect of food

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Health Benefits

- vegetarian diets : ↓ body weight ; obesity
  → lower risk of coronary heart disease
  hypertension, diabetes

  Thorogood et al., 2003
  Key et al., 1999
- vegetarians : lower medical costs
- chronic disease prevention :
  changes in body weight

  Barnard et al., 1995

結論

素食

提供減重者另一種飲食的選擇方式

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Thank you for attention