

Food and Nutrition for Cancer Prevention

Dr. Roselle Lee, MPH, PhD

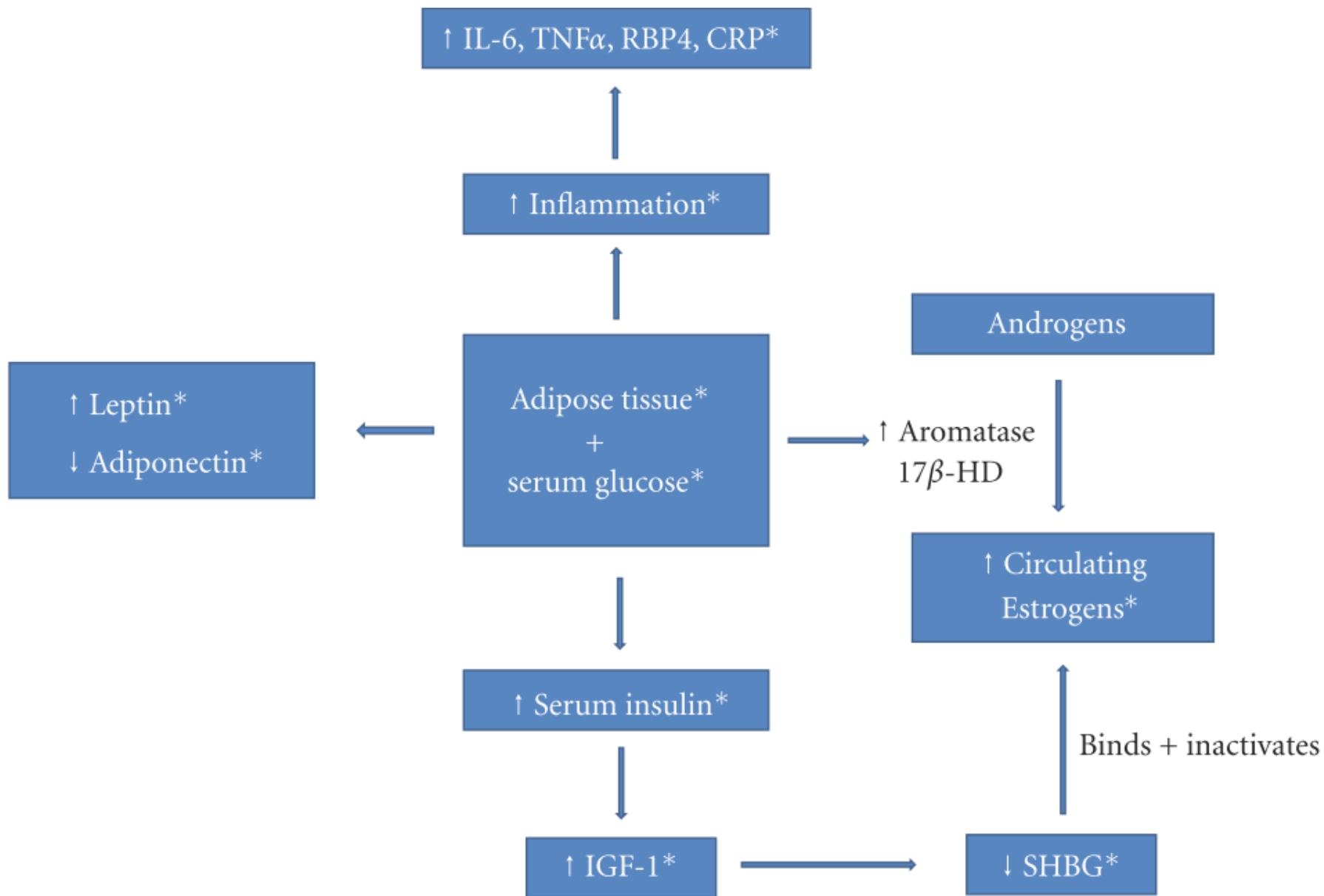
Hong Kong Breast Cancer Foundation
Nov 30, 2013



Outlines

- ❑ Meat-eater or vegetarian?
- ❑ Soy foods – good or bad?
- ❑ Cooking oil, which is the best?
- ❑ Organic food, worth its price?
- ❑ Exercise for health?







**MEAT-EATER OR
VEGETARIAN??**



Meat vs. Plant-foods

Per 100g	Meat	Fruit & Vegetables
Energy (kcal)	Beef/pork:106 - 190 chicken : 103 -256 Fish: 88 - 181 Egg: 60 – 156 Processed meat: 117-300	Leafy veg : 13 - 26 Gourd : 10 – 20 Mushroom : 17 - 26 Legumes : 27 - 44 Fruits: 24 - 91 Soyfood: 81 – 192
Fat (g)	0 - 40	<1.0



Meat vs. Plant-foods

Per 100g	Meat	Fruit & veg
Protein (g)	10 - 20	<3 Soyfood: 8 – 18 Nuts: 15 – 22
Carbohydrates (g)	0 - 15	2 - 16
Vitamins	Vitamin B12	Vitamin A, C, E, K Folic acid, ...
Minerals	Iron	

Meat = Carcinogenic?

- **High-temperature cooking**

=> produce Heterocyclic amines (HCA)

=> DNA damage

- **血基質鐵** (heme iron)

⇒ Produce N-Nitroso compounds in the intestine

⇒=>Carcinogenic

- **Processed Meat>> Red meat
>> White meat**



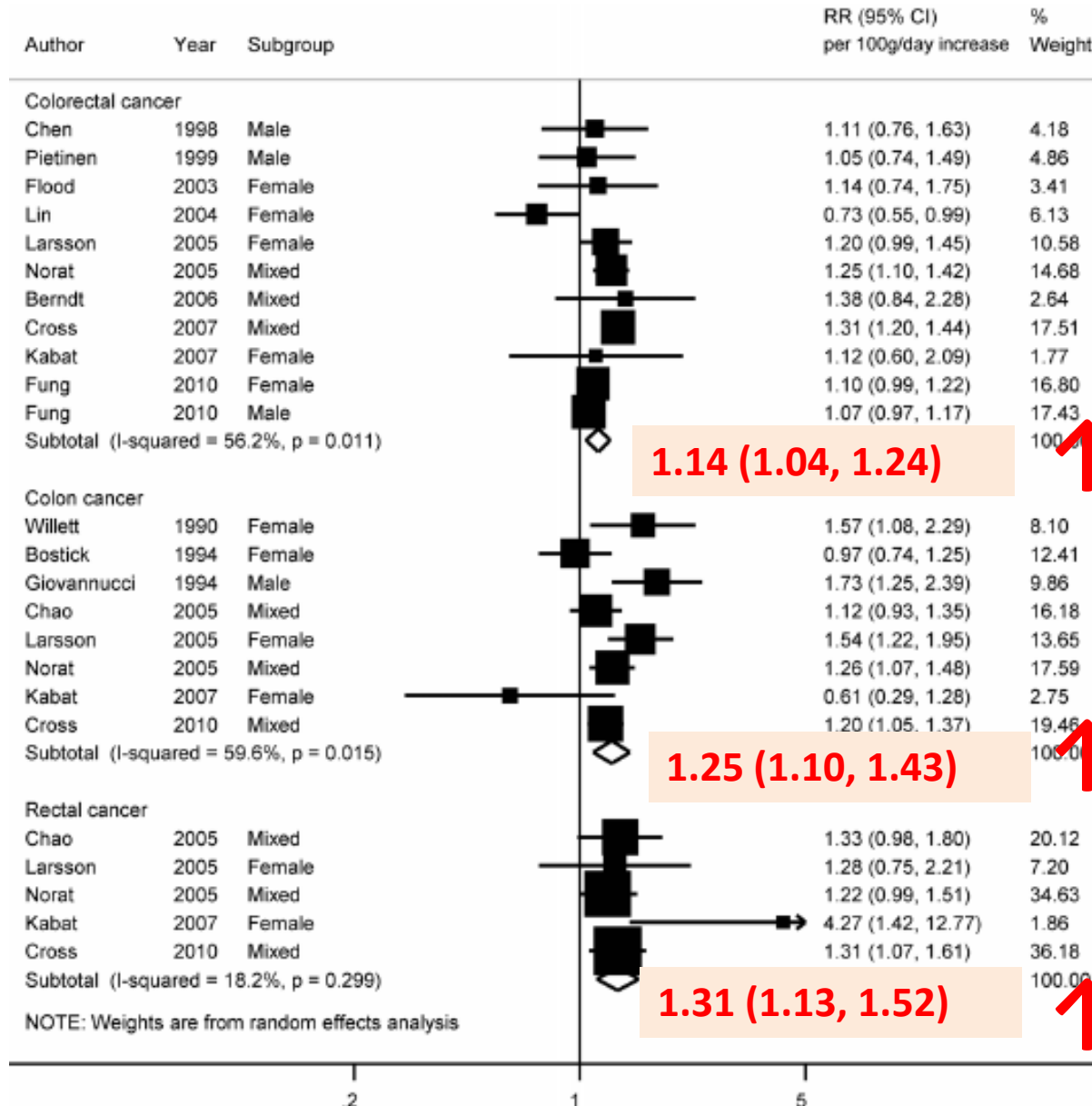
Meat consumption (per 100g) and Colorectal cancer risk

Chan *et al* (2011) PLoS One 6: 20456

Colo-rectal

Colon

Rectal



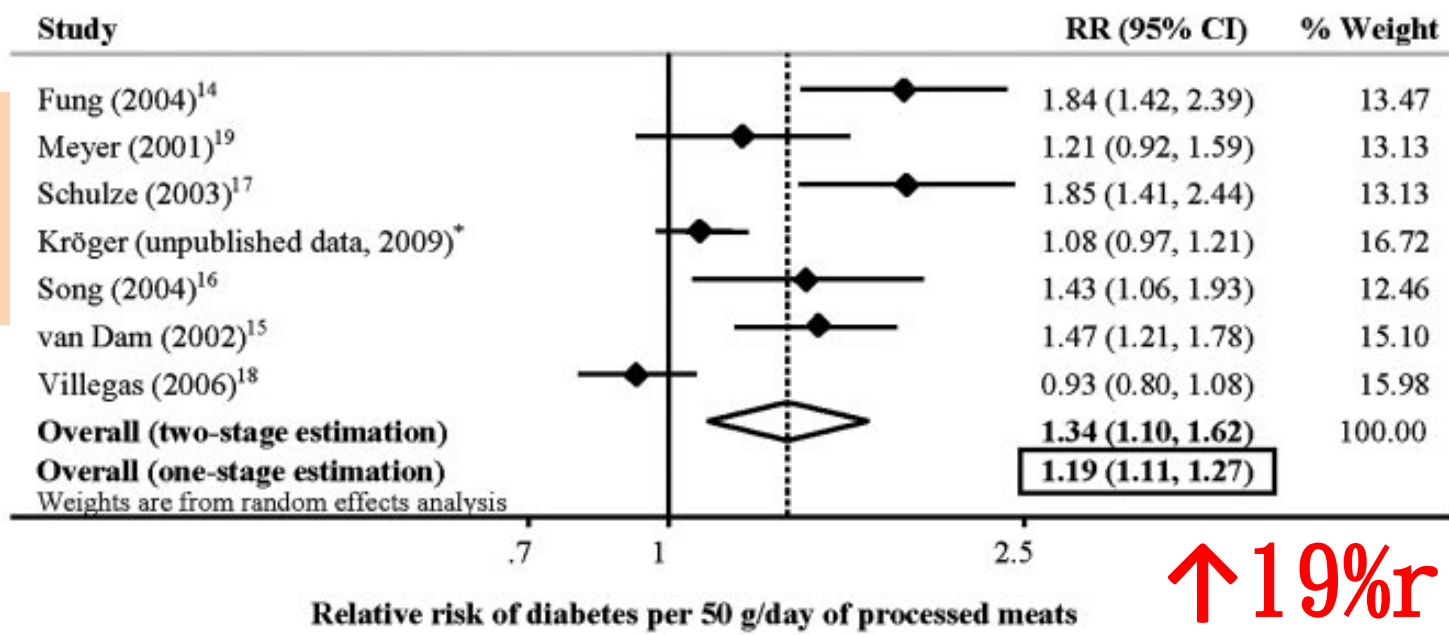
↑ 14% risk

↑ 25% risk

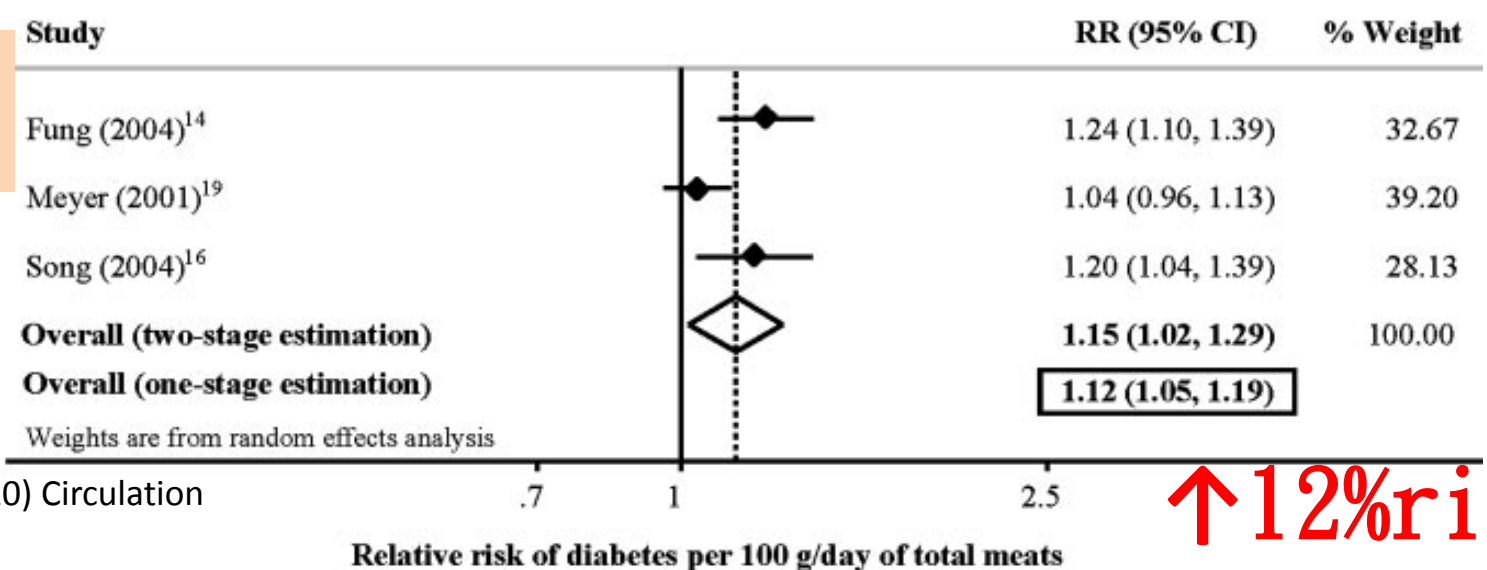
↑ 31% risk

Intake of meat and processed meat and risk of diabetes

Per 50g processed meat



Per 100g meat



要聞港聞 2013年02月01日 浸大肉類檢測 發現雌激素含量高 內地雞皮多吃或致卵巢癌

浸大肉類檢測 發現雌激素含量高 內地雞皮多吃或致卵巢癌

f 讚 251



Baptist University showed that a high level of estrogen is detected in the skin of chicken imported from PRC China.

Excess consumption may increase risk of ovarian cancer.

08:29pm 本港進入流感高峰期 半個月內2人亡
2,837

Higher intake of vegetables lower risk of recurrence

Women's Healthy Eating and Living (WHEL) Study, USA

N=3,088 , age 18-70, mean age=51y, Follow-up years:7.8y

Average daily intake of vegetables	Risk of recurrence (Among women taking Tamoxifen)
Total vegetable (2.3 bowls vs. $\frac{2}{3}$ bowls)	↓ 44% (23-59%)
Cruciferous (3/4 bowl vs. no consumption)	↓ 35% (11-53%)

Cruciferous Vegetables

Broccoli



Flowering cabbage



watercress



Bai Choi



Kale



Mustard green



Cruciferous vegetables

Chinese Cabbage



Cabbage



Cauliflower



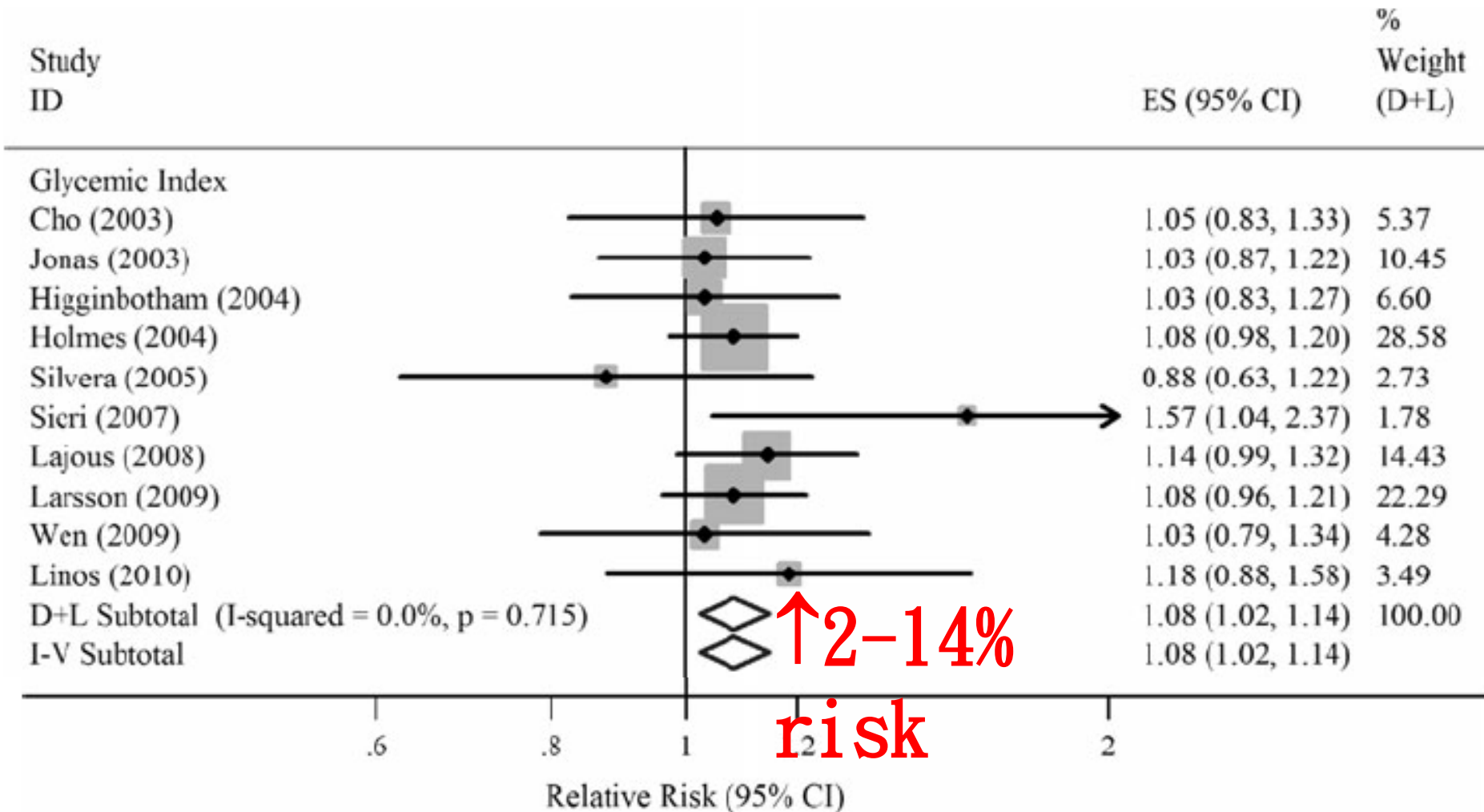
Radish



Turnip



Glycemic index and breast cancer risk



Glycemic Index

High	Low
White rice 72-94	Brown rice 66 – 87
White sugar 100	Honey 35 – 87
Apple juice 39 – 44	Apple 28 – 40
Instant cereal 66	Oats 51
Pasta (Cooked 20min) 64	Pasta (cooked <15min) 44

<http://www.glycemicindex.com>



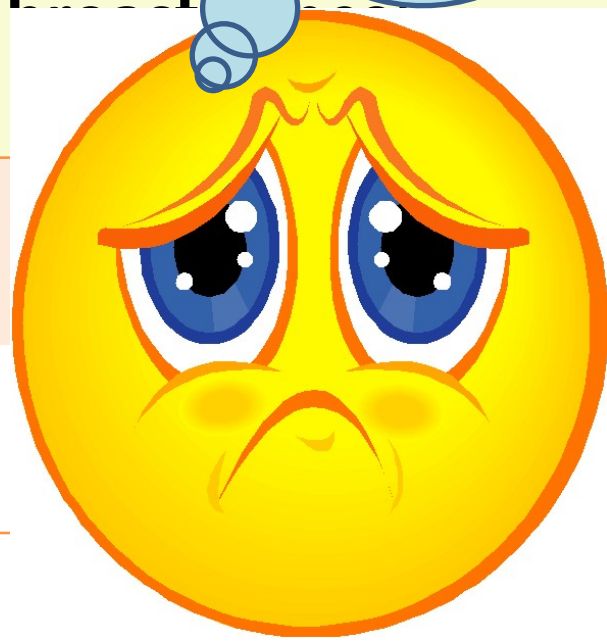
Vegetarian = Free from breast cancer?

EPIC-Oxford Study 英國牛津研究
N= 37,643 Follow-up

NOT statistically significant

Compare to meat eaters, the risk of breast cancer

Pre-menopausal	↓ 5%
Post-menopausal	↓ 21%



Display Settings: Abstract

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Indian J Pharmacol. 2012 Nov-Dec;44(6):732-6. doi: 10.4103/0253-7613.103273.

Shatavarins (containing Shatavarin IV) with anticancer activity from the roots of *Asparagus racemosus*.

Mitra SK, Prakash NS, Sundaram R.

Rajiv Gandhi University of Health Sciences, 4 T Block, Jayanagar, Bangalore, Karnataka, India.

Abstract

OBJECTIVES: The anticancer activity of shatavarins (containing shatavarin IV) isolated from the roots of *Asparagus racemosus* (Wild) was evaluated using in vitro and in vivo experimental models.

MATERIAL AND METHODS: The shatavarin IV was isolated from ethyl acetate insoluble fraction (AR-2B) of chloroform:methanol (2:1) (AR-2) extract of *A. racemosus* roots. The cytotoxicity (in vitro) of shatavarin IV and other shatavarins rich fraction was carried out using of MTT assay using MCF-7 (human breast cancer), HT-29 (human colon adenocarcinoma), and A-498 (human kidney carcinoma) cell lines. The in vivo anticancer activity of shatavarins (containing shatavarin IV) was evaluated against Ehrlich ascites carcinoma (EAC) tumor bearing mice.

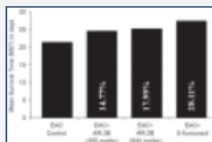
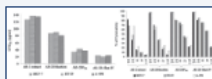
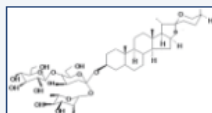
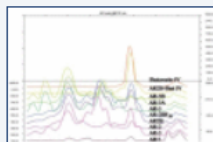
RESULTS: The isolated shatavarin IV (84.69 %) along with shatavarins rich fraction, coded AR-2B containing 5.05% shatavarin IV showed potent cytotoxicity. Oral administration of AR-2B to tumor bearing mice at doses of 250 and 500 mg/kg body weight for 10 days, showed significant reduction in percent increase in body weight, tumor volume, packed cell volume, viable tumor cell count, and increased non-viable cell count when compared to the untreated mice of the EAC control group. The restoration of hematological parameters towards normalcy was also observed.

CONCLUSION: The result suggests that the shatavarins (containing shatavarin IV) rich fraction (AR-2B) exhibits significant anticancer activity in both in vitro and in vivo experimental models.

KEYWORDS: Anticancer, *Asparagus racemosus*, cytotoxicity, ehrlich ascites carcinoma, shatavarin IV

PMID: 23248403 [PubMed - indexed for MEDLINE] PMCID: PMC3523501 [Free PMC Article](#)

Images from this publication. [See all images \(5\)](#) [Free text](#)



MeSH Terms, Substances

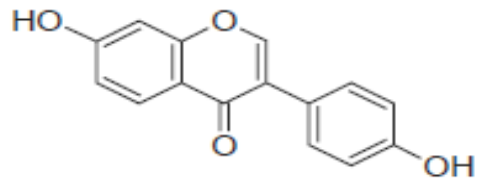
LinkOut - more resources

Links to resources such as full text articles and biological data

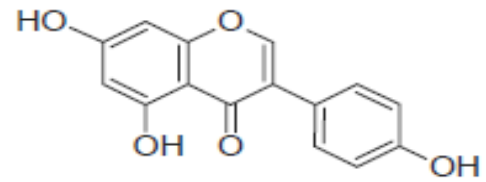
A collage of various soy-based foods. In the top left, there are green edamame pods. Below them is a glass bowl filled with yellow soybeans. To the right, a white cup is filled with soy milk. In the bottom right, there is a block of white tofu. In the bottom center, a small dark bowl contains green edamame. The background is a light-colored surface with a woven placemat.

SOY FOOD...
good or bad?

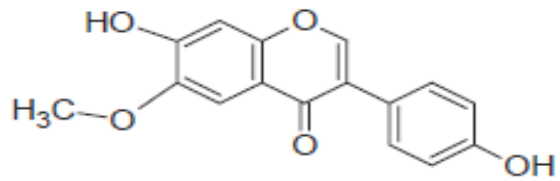
Isoflavones



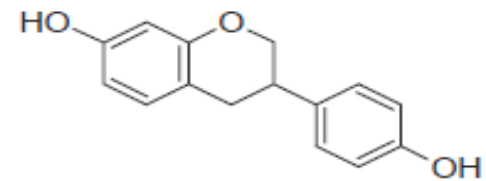
Daidzein



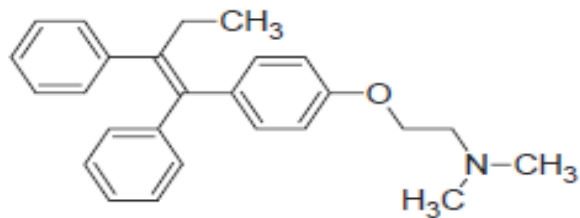
Genistein



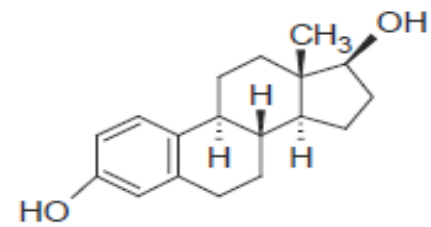
Glycitein



(R/S) Equol



Tamoxifen



17 -Estradiol

Geinstein

Binding affinity to hormonal receptors on mammalian cells:

- ER- α receptor : 0.017% of endogenous estrogen
- ER- β receptor: 7.4% of endogenous estrogen



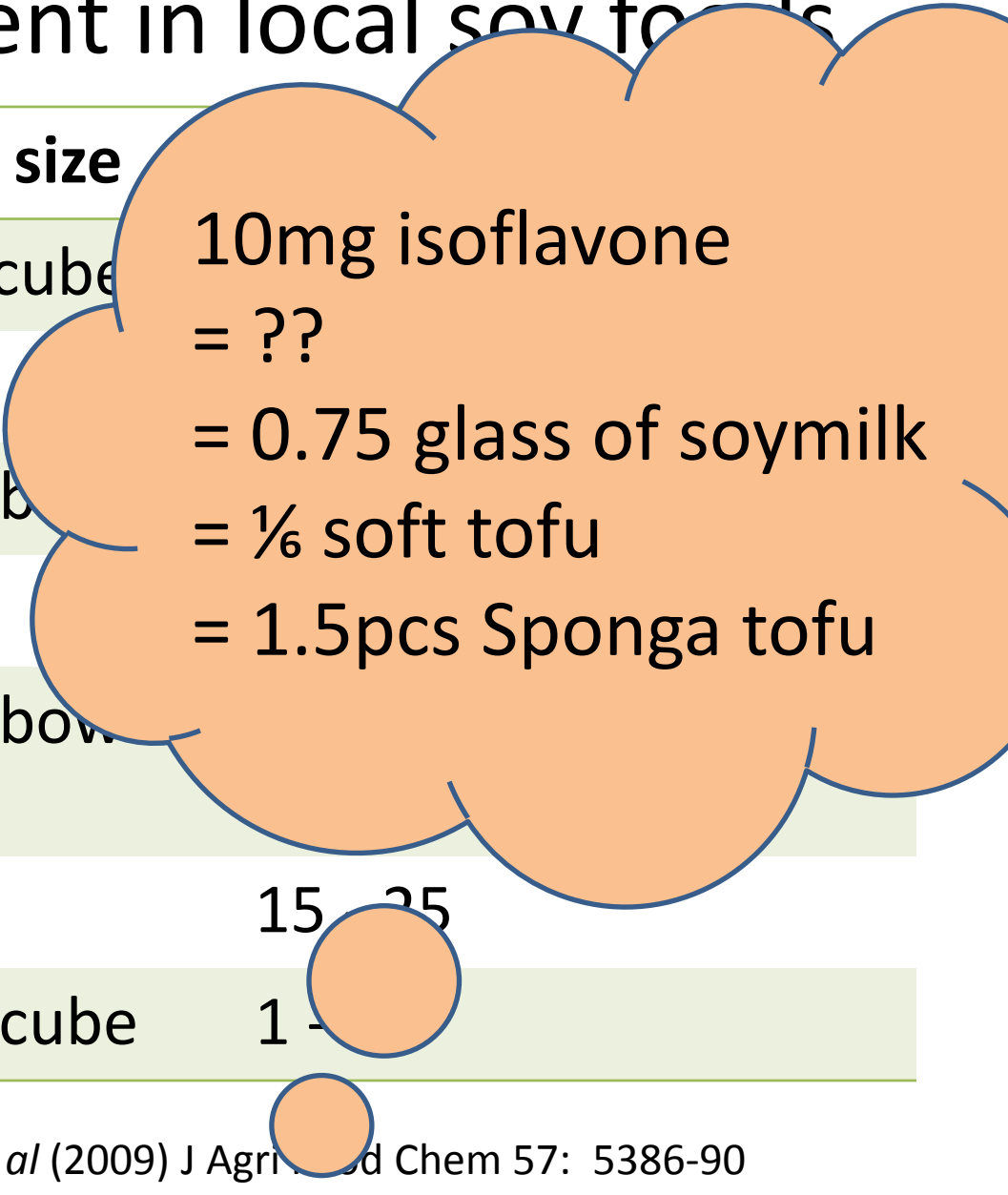
Soy food intake after diagnosis of breast cancer and future risk

After Breast Cancer Pooling Study (n=9,514) Follow-up=7.4y

isoflavones intake (mg/d)	Relative risk (95% confidence interval)		
	All-cause mortality	Breast cancer specific mortality	Breast cancer recurrence
≥ 10.0 vs. < 4.0	0.87 (0.70, 1.10)	0.83 (0.64, 1.07)	0.75 (0.61, 0.92)
	↓ 13%	↓ 17%	↓ 25% (8 – 39%)

Isoflavone content in local soy foods

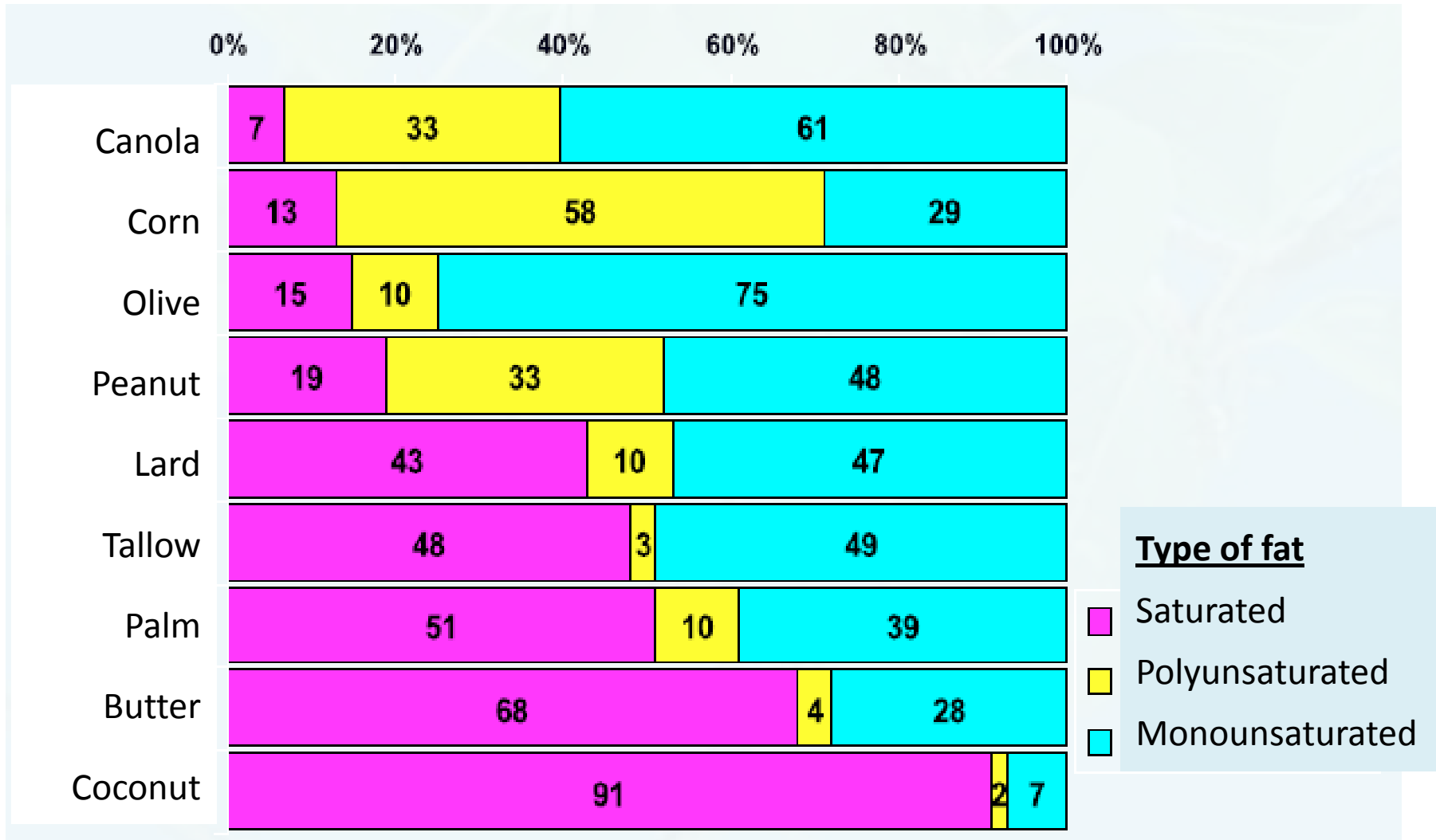
Soy food	Serving size	Isoflavone content (mg)
Soft tofu	1 large cube	10
Prepacked tofu	1 box	15 - 25
Tofu skin	1 small bowl	1
Spongy tofu	4 pcs	15 - 25
Vegetarian chicken	1 small bowl	1
Soy milk	250ml	15 - 25
Fermented tofu	1 small cube	1



Cooking oil,
which is the
best?



Fatty acid content of cooking oil





Is coconut oil good for you?

Q *Would you please comment on the current craze for coconut oil? I now have friends who, based on ads and popular books, are taking coconut oil several times a day.*

A All we know is that it has **both good and bad effects on cholesterol**. But we also know that vegetable oils like olive oil and soybean oil, which are mainly unsaturated fat, lower LDL and increase HDL—both good effects. So **coconut oil may be less unhealthy than butter or lard**, but it is probably **less healthy than vegetable oils like olive or soybean oil**.

It's fine to use it now and then, but I wouldn't use it on a regular basis.

Organic food – worth its price?



Organic vs. Conventional crops

TABLE 1
Comparison of content of nutrients and other nutritionally relevant substances in organically and conventionally produced crops as reported in satisfactory-quality studies

Nutrient category ¹	No. of studies	No. of comparisons	Results of analysis		Higher concentrations in organic or conventional crops?
			Standardized difference ²	<i>P</i>	
			%		
Nitrogen	17	64	6.7 ± 1.9	0.003	Conventional
Vitamin C	14	65	2.7 ± 5.9	0.84	No difference
Phenolic compounds	13	80	3.4 ± 6.1	0.60	No difference
Magnesium	13	35	4.2 ± 2.3	0.10	No difference
Calcium	13	37	3.7 ± 4.8	0.45	No difference
Phosphorus	12	35	8.1 ± 2.6	0.009	Organic
Potassium	12	34	2.7 ± 2.4	0.28	No difference
Zinc	11	30	10.1 ± 5.6	0.11	No difference
Total soluble solids	11	29	0.4 ± 4.0	0.92	No difference
Copper	11	30	8.6 ± 11.5	0.47	No difference
Titrateable acidity	10	29	6.8 ± 2.1	0.01	Organic

¹ Nutrient categories are listed by numeric order of the included studies.

² All values are means ± SEs (robust).

Hormones in milk

- Bovine growth hormone (GH) is biologically inactive in humans
- Bovine GH is degraded in the acidic stomach environment
- 90% of bovine GH in milk is destroyed during the pasteurization process
- No evidence that milk content (fat, protein, and lactose) or vitamin/mineral in milk is altered by treatment with bovine GH
- Estradiol and estrone concentrations in milk from organic and conventional milk cows treated with estrogen are similar.
- Concentrations of sex steroids: Higher as the fat content of the milk increased regardless of organic or conventional origin.

Evidence is clear that ...

- Organic farming prohibits the nontherapeutic use of antibiotic agents
- Antibiotics use promotes the development of drug-resistant organisms in the animals.
- **Human disease caused by antibiotic-resistant organisms spread through the food chain.**
- Organic farming could contribute to a reduction in the threat of human disease caused by drug-resistant organisms.
- Organic produce consistently has lower levels of pesticide residues than does conventionally grown produce
- A diet of organic produce reduces human exposure to pesticide residues



Weight management plan!

- 1Lb of body fat = 3500 kcal
- 30 min brisk walking = 200kcal
- 5 days per week = $200\text{kcal}/\text{d} \times 5\text{d} = 1000\text{kcal}$
- **1 month =**
1 Lb of body fat loss!



Dr. Budwig's Diet (布緯食療)

- Deep breathing
- Soft walk or Low jog (30 min)
- Seat bounces
- Sunbathing everyday (10 – 15min)



Exercise and Breast Cancer Survival

Shanghai Breast Cancer Survival Study

Exercise frequency	First 18 months Postdiagnosis	First 36 months Postdiagnosis
Exercise participation per week, h		
No exercise	Reference gp	Reference gp
<2.5	↓30% (10 – 46%)	↓37% (22 – 54%)
≥2.5	↓27% (6 – 43%)	↓43% (26 – 56%)
Exercise energy expenditure, MET- hours per week		
No exercise	Reference gp	Reference gp
<8.3	↓30% (9 – 46%)	↓40% (22 – 54%)
≥8.3	↓28% (7 – 43%)	↓41% (24 – 55%)

Exercise for health

WINS study

- Follow-up: >5y
- Reduced fat diet
- Mild weight loss (2.4kg)

- Risk of recurrence:
↓24% (2 – 40%)

WHEL study

- Follow-up:7.3y
- Low fat and high fruit, vegetable, and fibre
- Weight gain: 1.1kg

- No reduction in recurrence risk



Final message

One hour of walking

Two Servings of fruit per day

Three Servings of veggie per day

400 gram of red meat or less per week

Watch your weight!

