Meat and dairy product consumption and cancer risk

EAAP Belfast 31 August 2016

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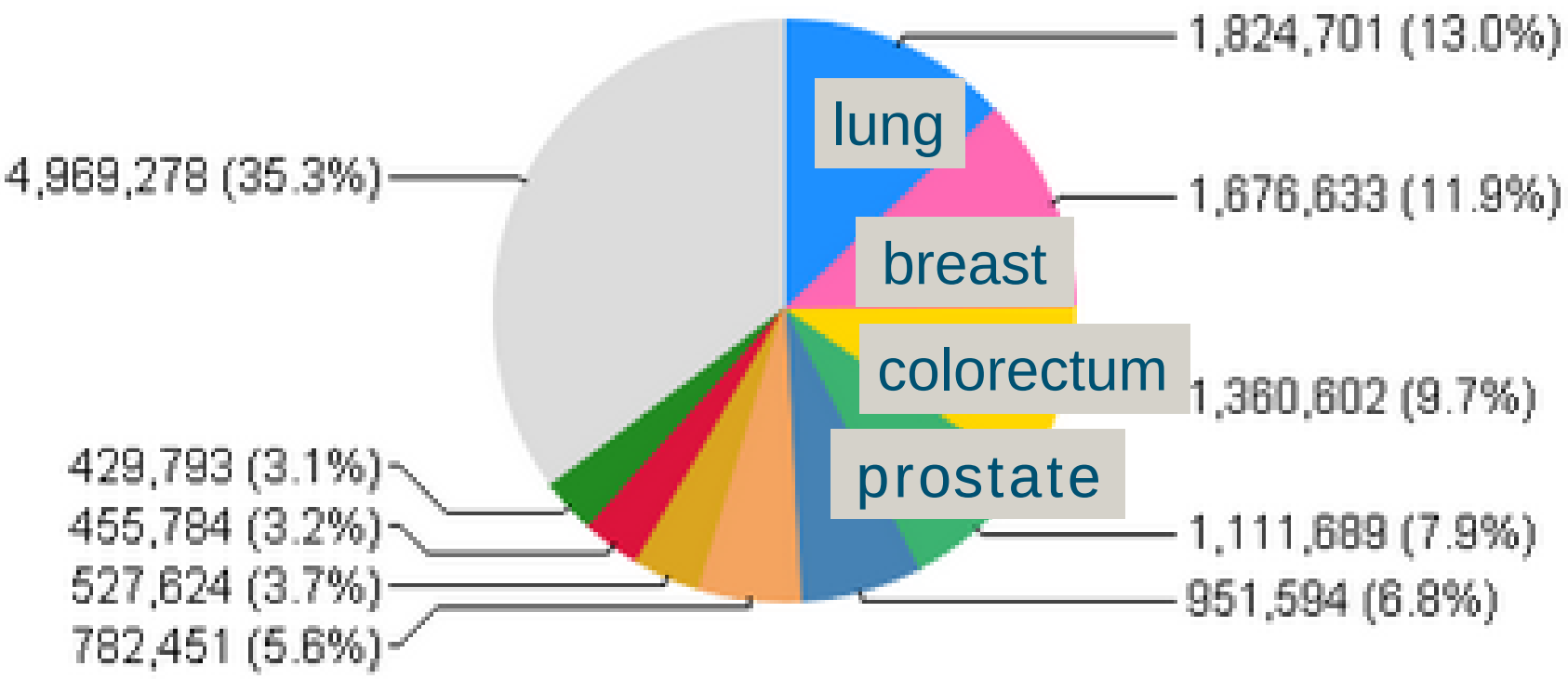
Global cancer incidence in 2012

14.1 million new patients per year in the world



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Globocan, 2012; http://globocan.iarc.fr/Pages/fact_sheets_population.aspx



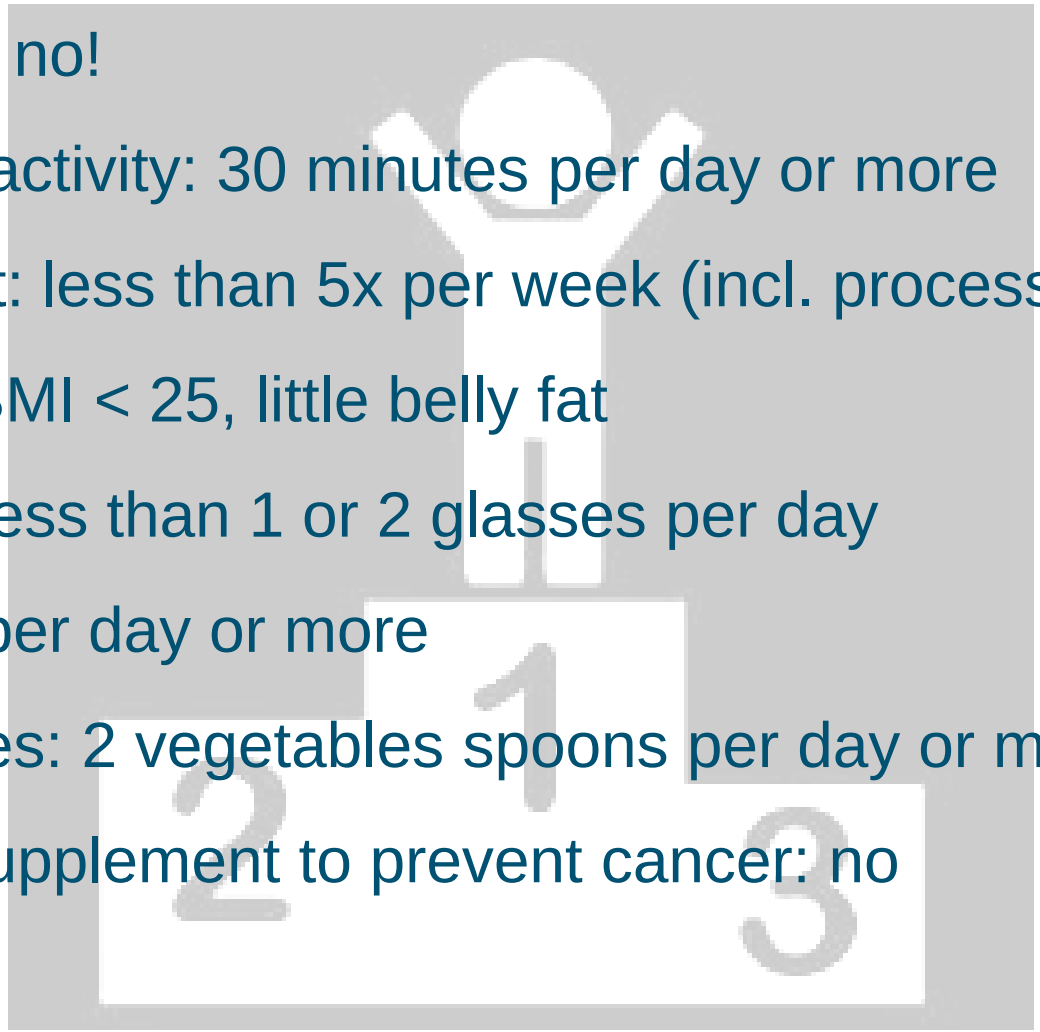
1/3 of the most common types of cancer be prevented by more physical activity and eating healthier



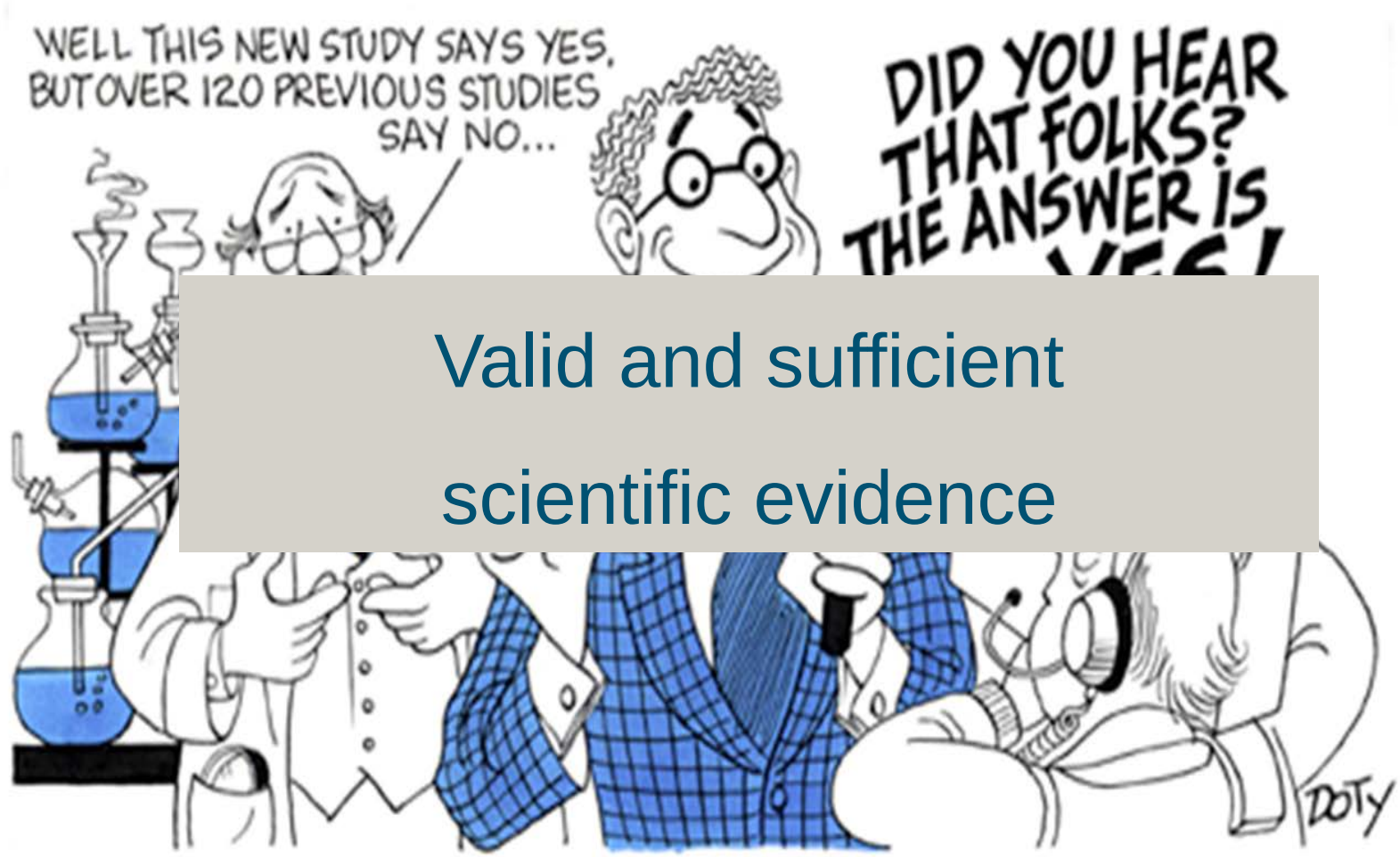
Recommendations for cancer prevention

Who stays…?

- ✓ Smoking: no!
- ✓ Physical activity: 30 minutes per day or more
- ✓ Red meat: less than 5x per week (incl. processed meat)
- ✓ Weight: BMI < 25, little belly fat
- ✓ Alcohol: less than 1 or 2 glasses per day
- ✓ Fruit: 2x per day or more
- ✓ Vegetables: 2 vegetables spoons per day or more
- ✓ Dietary supplement to prevent cancer: no

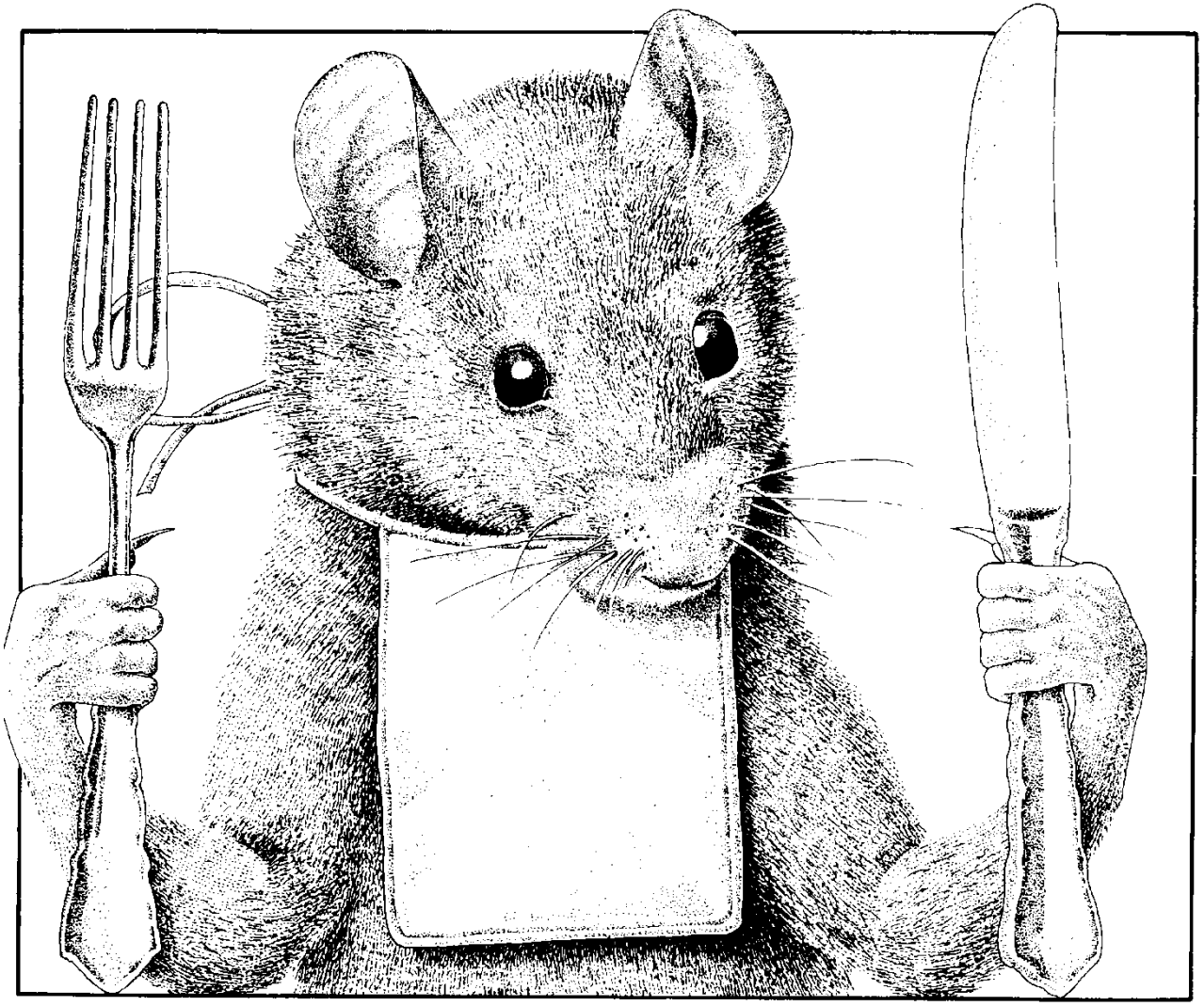


How do we know what is causing/preventing cancer?



Valid and sufficient

scientific evidence



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Analytical epidemiology: Cohort study

High intake of red and processed meat

Colorectal cancer

population

Low intake of red and processed meat

No colorectal cancer

Follow-up time (years)

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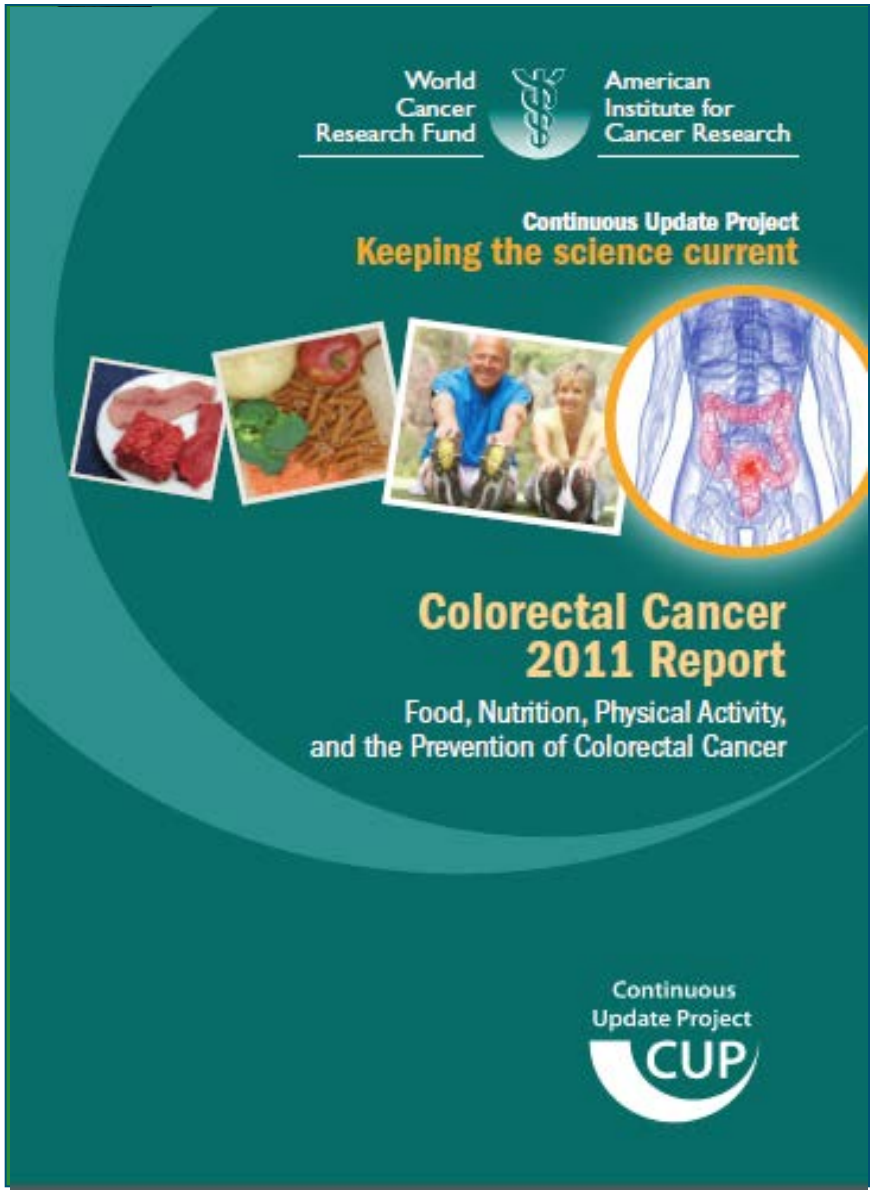

Systematic literature review and meta-analyses

- animal and in-vitro studies
- 10.000 epidemiological studies
- 9 international centres

Continuous Update Project CUP

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http://www.wcrf.org/cancer_research/cup/

Grading the evidence

- Convincing
- Probable

Basis for recommendations

- Limited Evidence – Suggestive
- Limited Evidence – No Conclusion

- Substantial Effect on Risk Unlikely

World Cancer Research Fund International

Grading the evidence *Convincing*

- Strong and unlikely to change in future
- No unexplained heterogeneity
- At least 2 independent cohort studies
- Good quality studies that account for error
- Dose response
- Robust evidence from laboratory studies

World Cancer Research Fund International

Grading the evidence *Probable*

- No unexplained heterogeneity
- At least 2 independent cohort or 5 case-control studies
- Good quality studies that account for error
- Dose response
- Plausible evidence from laboratory studies

World Cancer Research Fund International

Recommendations for cancer prevention

No recommendation on dairy

Meat products and cancer

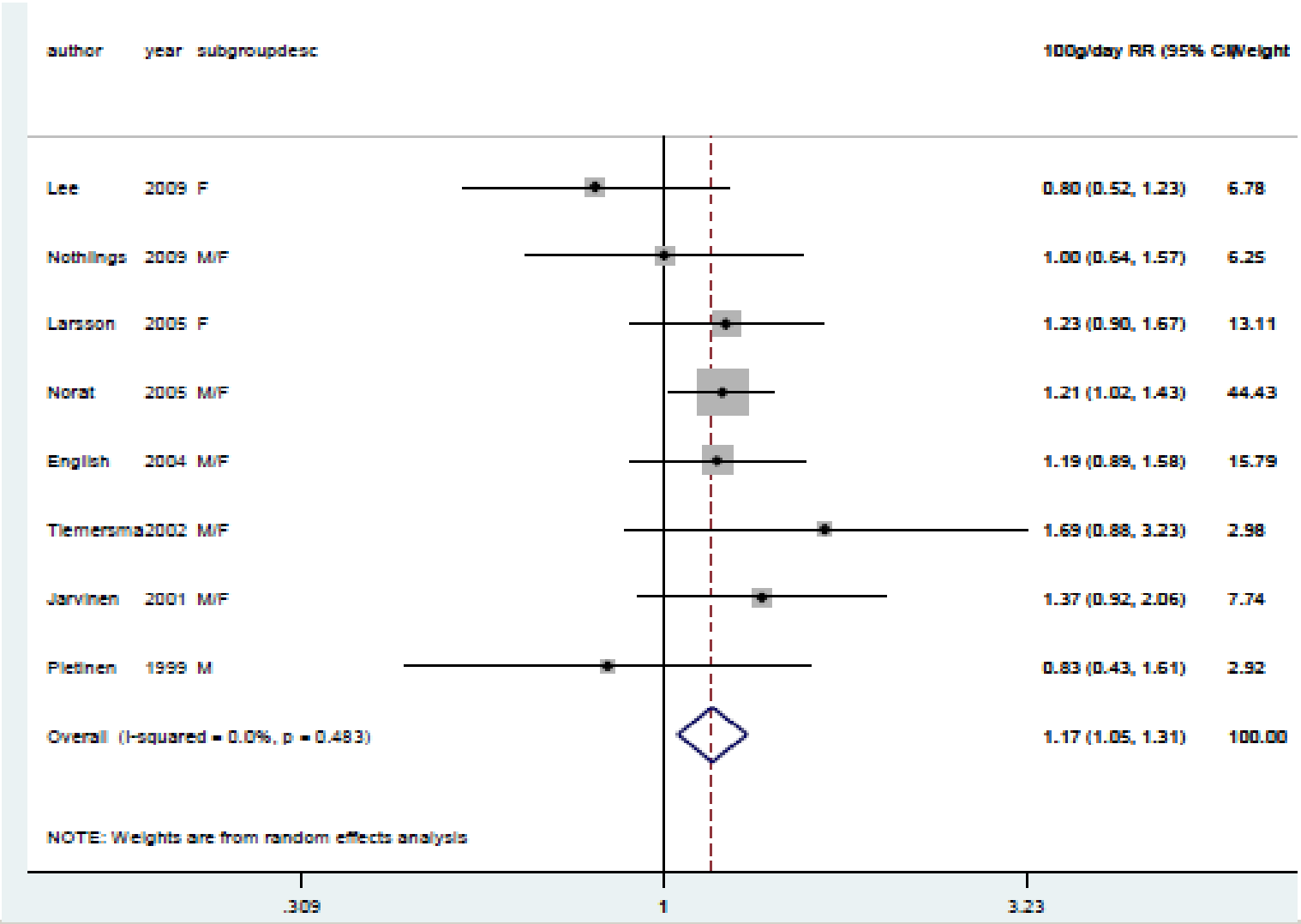
Red meat:

beef, pork, lamb, and goat from domesticated animals including that contained in processed foods

Processed meat:

meat preserved by smoking, curing or salting, or addition of chemical preservatives, including that contained in processed foods

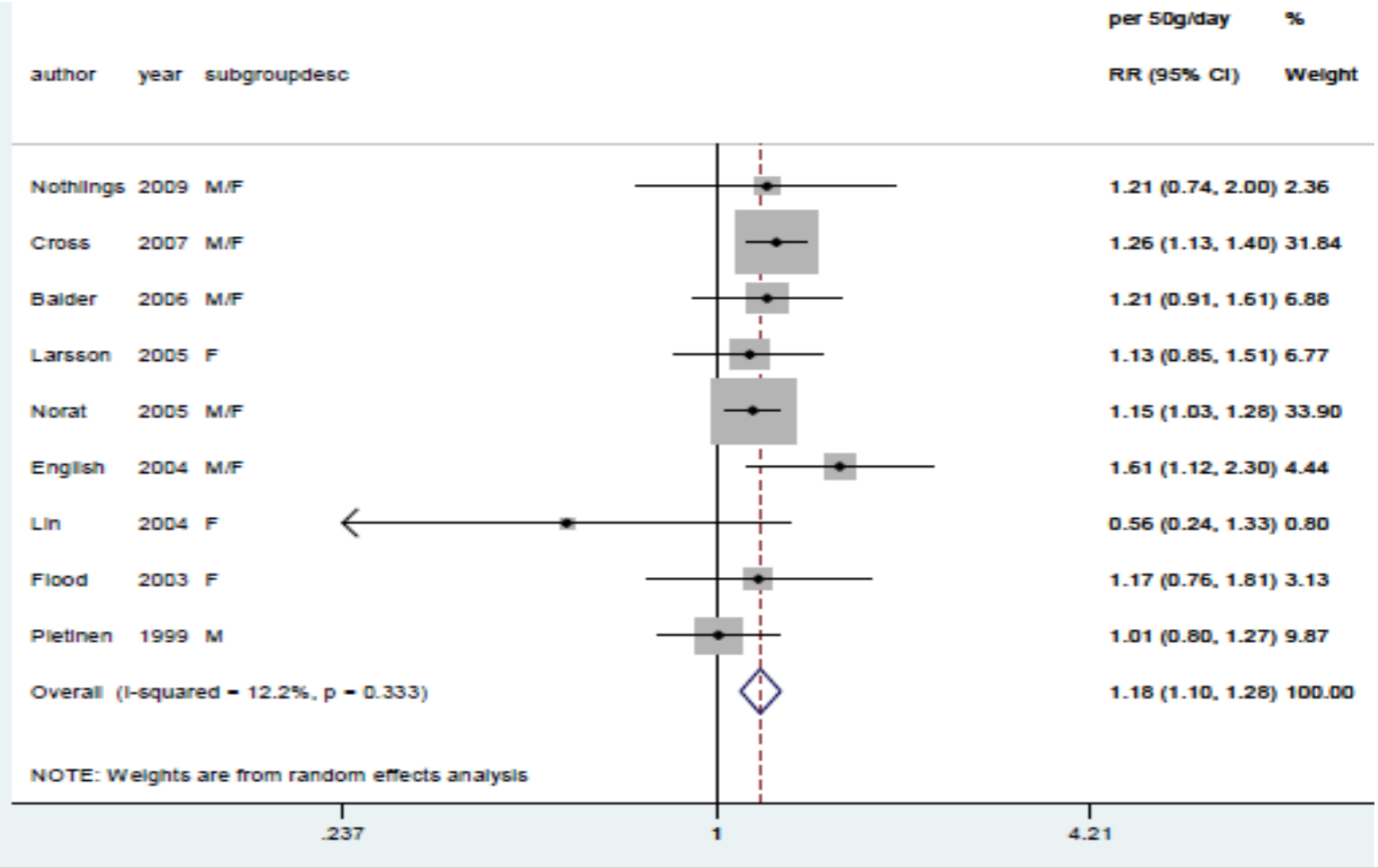
Red meat and colorectal cancer per 100 g/day



Per 100 grams of red meat the relative risk increases with 17%

WCRF/AICR CUP 2011; Chan et al, PlosOne 2011

Processed meat and colorectal cancer per 50g/day



Per 50 gram processed meat the relative risk increases with 18%

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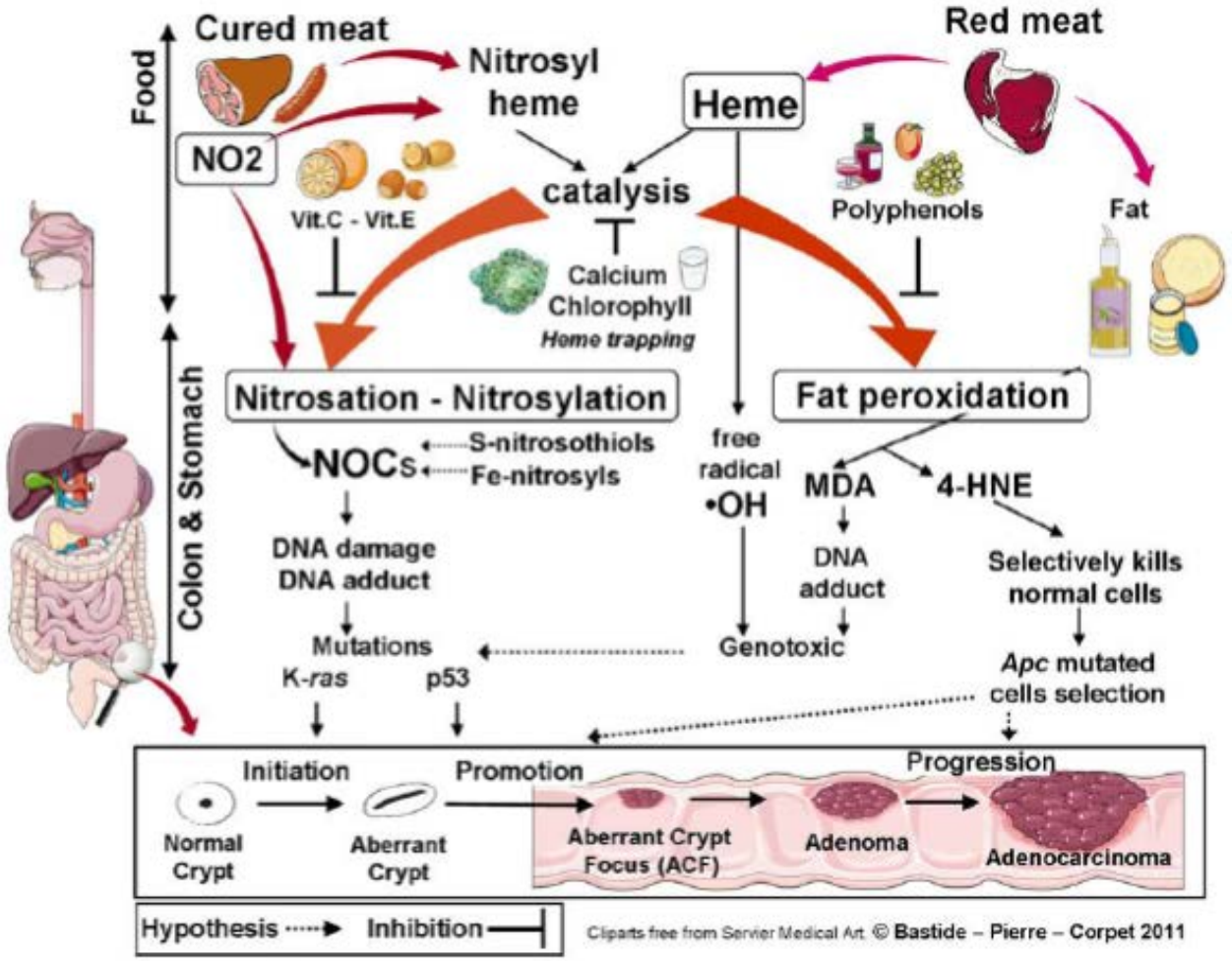
WCRF/AICR CUP 2011; Chan et al, PlosOne 2011

What is the underlying mechanism?



Food, nutrition, physical activity & cancer

FOOD, NUTRITION, PHYSICAL ACTIVITY AND CANCERS OF THE COLON AND THE RECTUM 2011

	DECREASES RISK	INCREASES RISK
Convincing	**Physical activity[1,2]** **Foods containing dietary fibre[3]**	**Red meat[4,5]** **Processed meat[4,5]** **Alcoholic drinks (men)[7]** **Body fatness** **Abdominal fatness** **Adult attained height[8]**
Probable	Garlic Milk[9] Calcium[10]	**Alcoholic drinks (women)[7]**
Limited - suggestive	Non-starchy vegetables Fruits Foods containing vitamin D[3,12]	Foods containing iron[3,4] Cheese[11] Foods containing animal fats[3] Foods containing sugars13
Limited - no conclusion	Fish; glycaemic index; folate; vitamin C; vitamin E; selenium; low fat; dietary pattern	
Substantial effect on risk unlikely	None identified	

2016 DIET, NUTRITION, PHYSICAL ACTIVITY AND STOMACH CANCER

		DECREASES RISK	INCREASES RISK
STRONG EVIDENCE	**Convincing**		
	Probable		**Body fatness (cardia)[1]** **Alcoholic drinks[2]** **Foods preserved by salting[3]** **Processed meat (non-cardia)**
LIMITED EVIDENCE	**Limited – suggestive**	Citrus fruit (cardia)	Grilled (broiled) or barbecued (charbroiled) meat and fish Low fruit intake
	Limited – no conclusion	Cereals (grains) and their products; dietary fibre; vegetables; pulses (legumes); potatoes, starchy roots, tubers and plantains; citrus fruit (non-cardia); nuts and seeds; herbs, chilli; spices and condiments; meat (unprocessed); processed meat (cardia); poultry; fish (unprocessed); eggs; milk and dairy products; total salt; added salt; fruit juices; coffee; tea; green tea; frying; drying or dried food; dietary nitrate and nitrite; Nitrosodimethylamine; protein; fats and oils; total fat; fatty acid composition; cholesterol; sugars; beta-carotene; retinol; thiamin; riboflavin; vitamin C; vitamin D; multivitamin/mineral supplements; calcium; iron; selenium; body fatness (non-cardia); physical activity; sedentary behaviour; adult attained height; energy intake	
STRONG EVIDENCE	**Substantial effect on risk unlikely**		

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WCRF/AICR CUP 2011, 2016

In the media: October last year...

Processed and red meat: what are the cancer risks?

The following Q&A was produced by the World Health Organisation's International Agency for Research on Cancer

The New York Times


W.H.O. Advises Pregnant Women to Avoid Areas Where Zika Is Spreading


ASK WELL
Ask Well: Booster Shots for Grown-Ups


WELL
Fasting Diets Are Gaining Acceptance


THE CHECKUP
The Always H
Teenage Boy

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Health

Processed meats do cause cancer - WHO

By James Gallagher
Health editor, BBC News website

26 October 2015 | Health

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Processed meat like bacon linked to cancer, red meat deemed risky too: WHO

BY KERRY BURKE, NANCY DILLON, REUVEN BLAU / NEW YORK DAILY NEWS /

Updated: Tuesday, November 3, 2015, 10:39 AM

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HEALTH

Meat Is Linked to Higher Cancer Risk, W.H.O. Report Finds

By ANAHAD O'CONNOR OCT. 26, 2015

WHO/IARC report 2015

International Agency for Research on Cancer

World Health Organization

PRESS RELEASE
N° 240

26 October 2015

> 800 studies reviewed by 22 experts from 10 countries

Red meat was classified as ***probably carcinogenic to humans* (Group 2A)**, based on ***limited evidence*** that the consumption of red meat causes cancer in humans and ***strong* mechanistic evidence** supporting a carcinogenic effect. This association was observed mainly for colorectal cancer, but associations were also seen for pancreatic cancer and prostate cancer.

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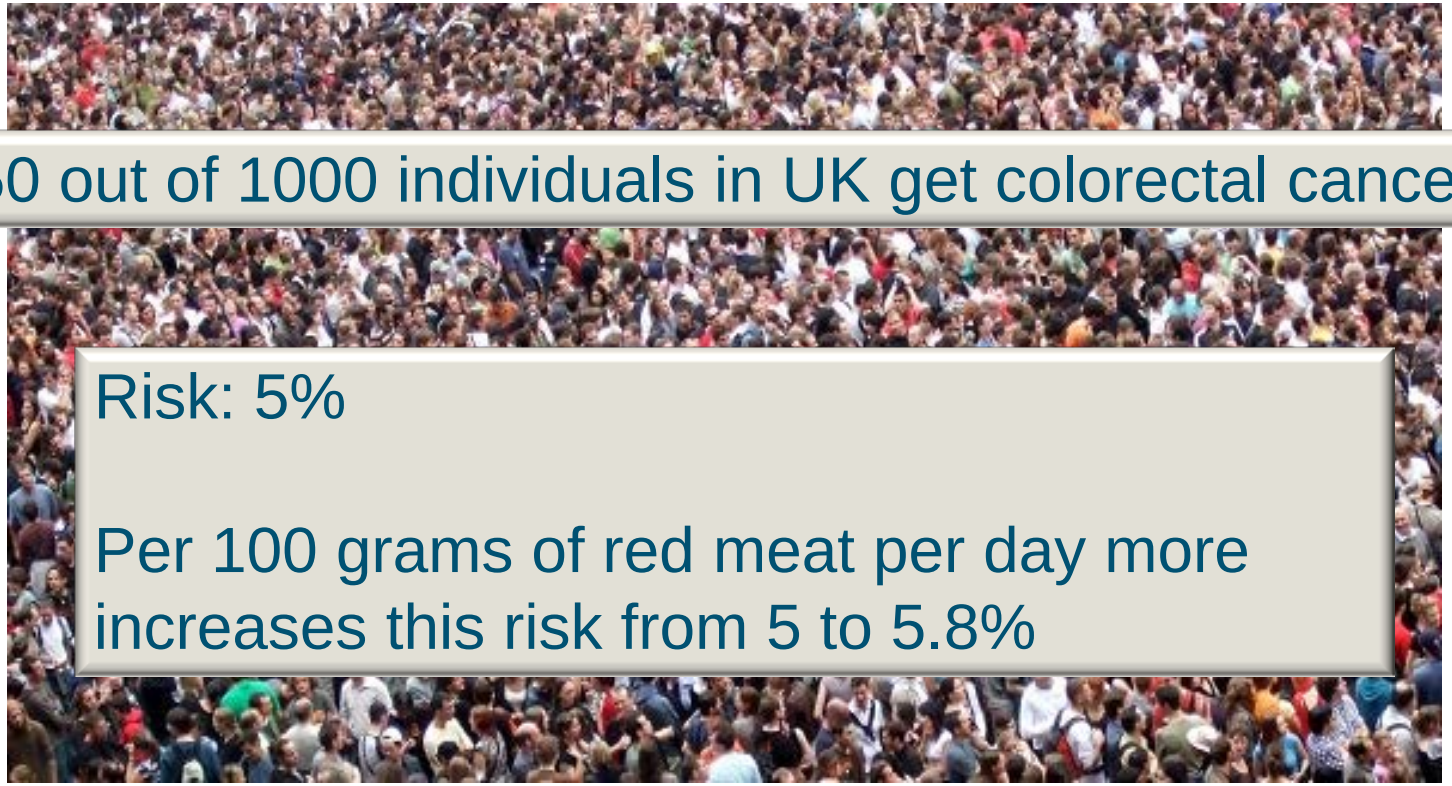
Volume 114 of the IARC Monographs

The Lancet Oncology 2015

What does it mean?

Per 100 grams of red meat the relative risk increases with 17%



50 out of 1000 individuals in UK get colorectal cancer

Risk: 5%

Per 100 grams of red meat per day more increases this risk from 5 to 5.8%

Red and processed meat versus smoking

The e… of cancer is far h…

The Telegraph

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Politics Investigations Obits Education Science Earth Weather Health Royal Celebrity

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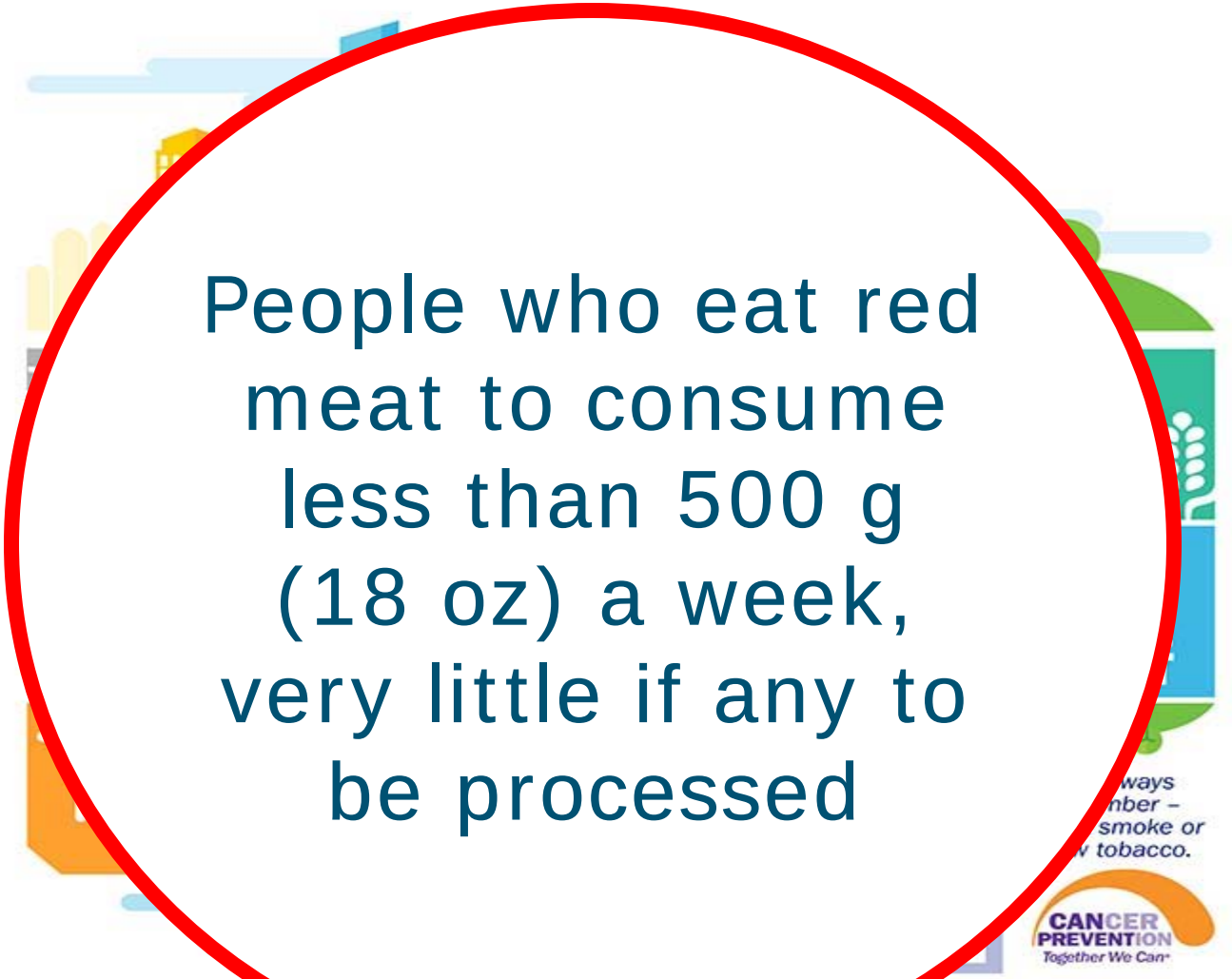
Bacon, ham and sausages 'as big a cancer threat as smoking', WHO to warn

The WHO is expected to publish a report listing processed meat as a cancer-causing substance with the highest of five possible rankings

Recommendations for cancer prevention

People who eat red meat to consume less than 500 g (18 oz) a week, very little if any to be processed

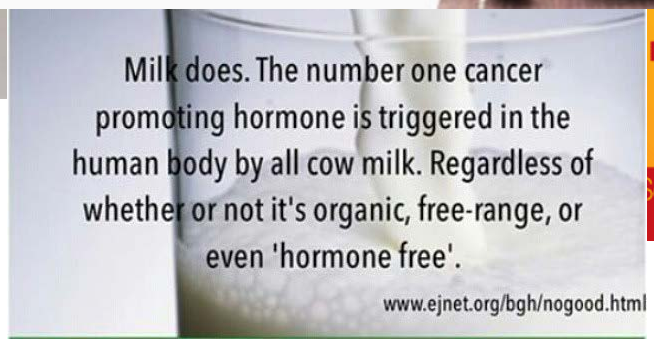


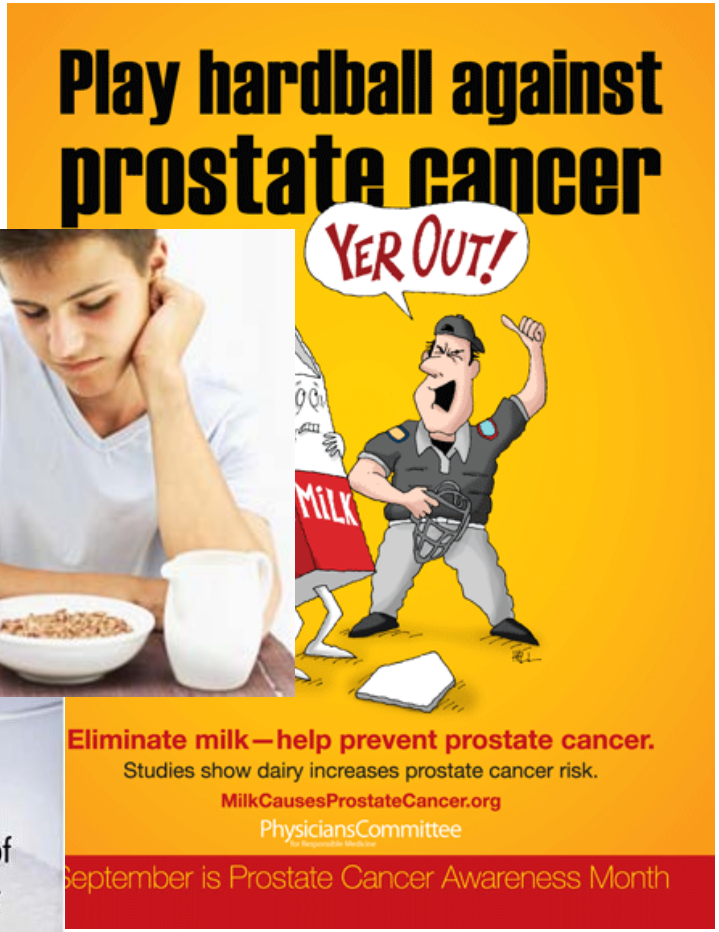
Dairy and cancer

In the media...

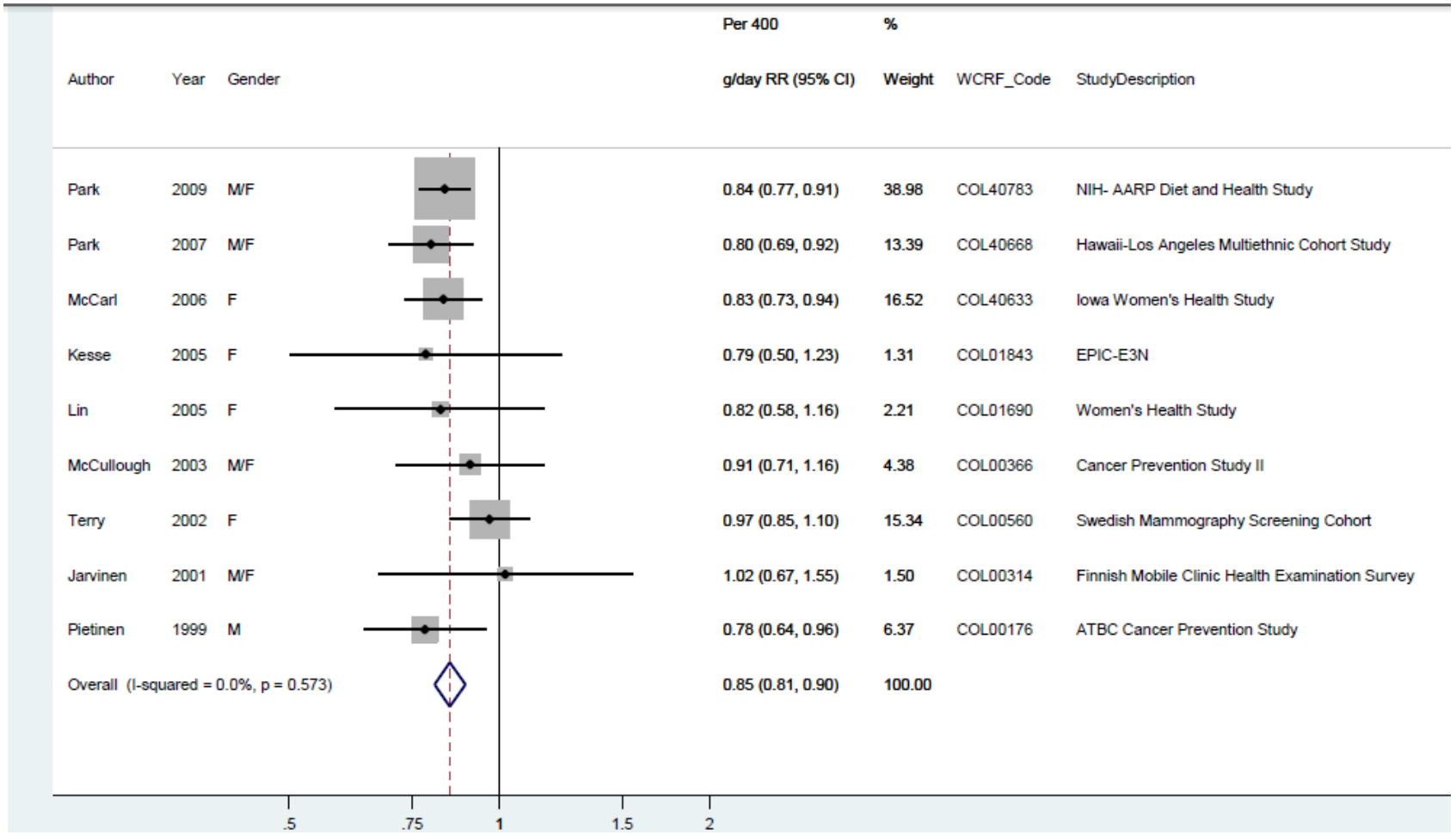

Milk:
Good for Calves,
Bad for

Got Milk?
NO THANKS!
Milk has been linked to bone fractures, certain types of cancer, cardiovascular disease, and other health problems.
PhysiciansCommittee


Milk does. The number one cancer promoting hormone is triggered in the human body by all cow milk. Regardless of whether or not it's organic, free-range, or even 'hormone free'.
www.ejnet.org/bgh/nogood.html


Play hardball against prostate cancer
YER OUT!
MILK
Eliminate milk—help prevent prostate cancer.
Studies show dairy increases prostate cancer risk.
MilkCausesProstateCancer.org
PhysiciansCommittee
September is Prostate Cancer Awareness Month

Total dairy and colorectal cancer – per 400 g/day



Per 400 grams of dairy the relative risk decreases with 15%

Dairy and colorectal cancer: potential mechanisms

Calcium (and vitamin D):

- Binding of bile acids, free fatty acids
- Direct influence by restraining cellular proliferation
- Promotes differentiation and apoptosis

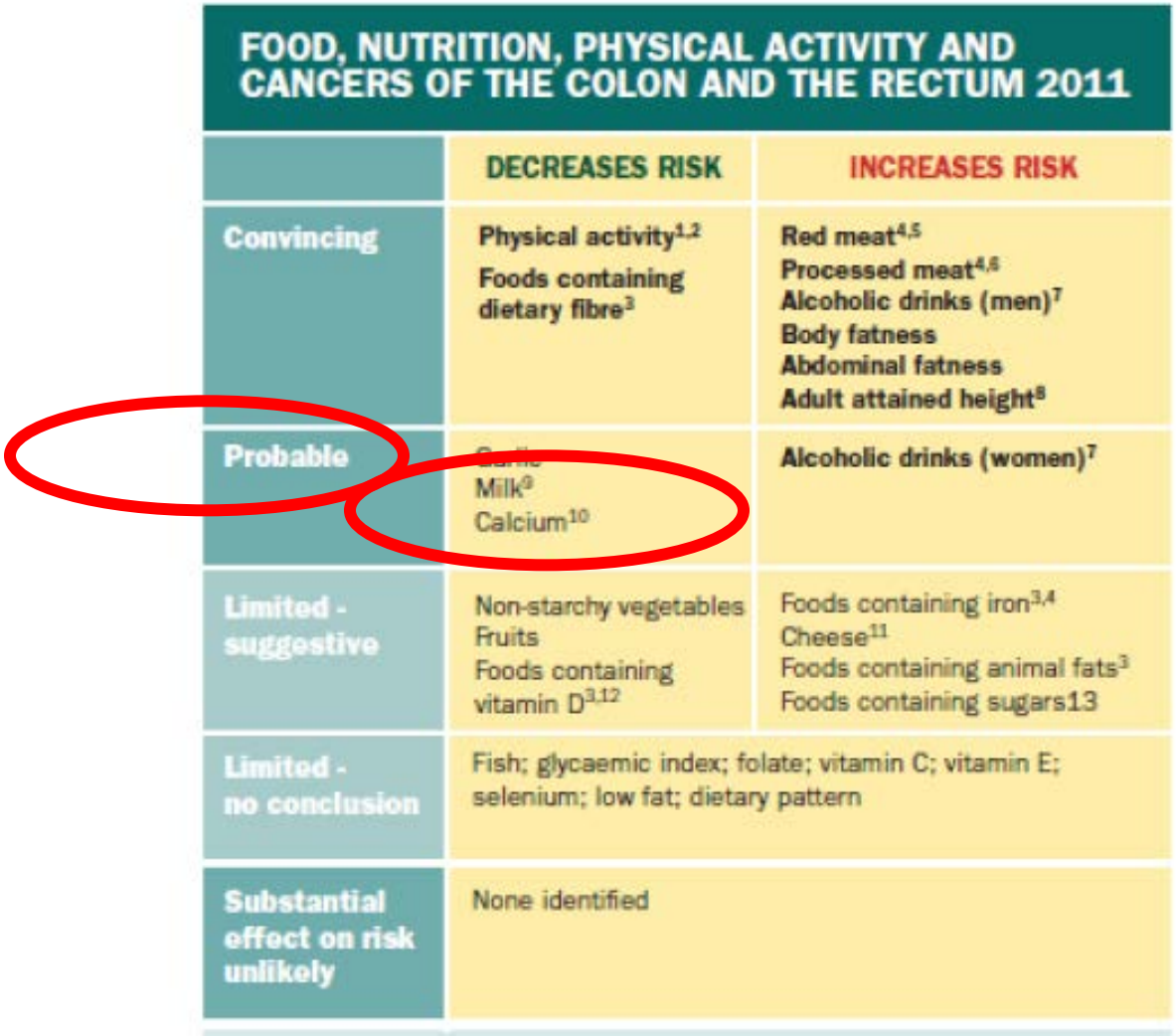
Fermented dairy:

- Favourable effect on colorectal mucosa?

Other?

- Vitamin B2: DNA-methylation

Food, nutrition, physical activity & colorectal cancer



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Substantial effect on risk unlikely	None identified	

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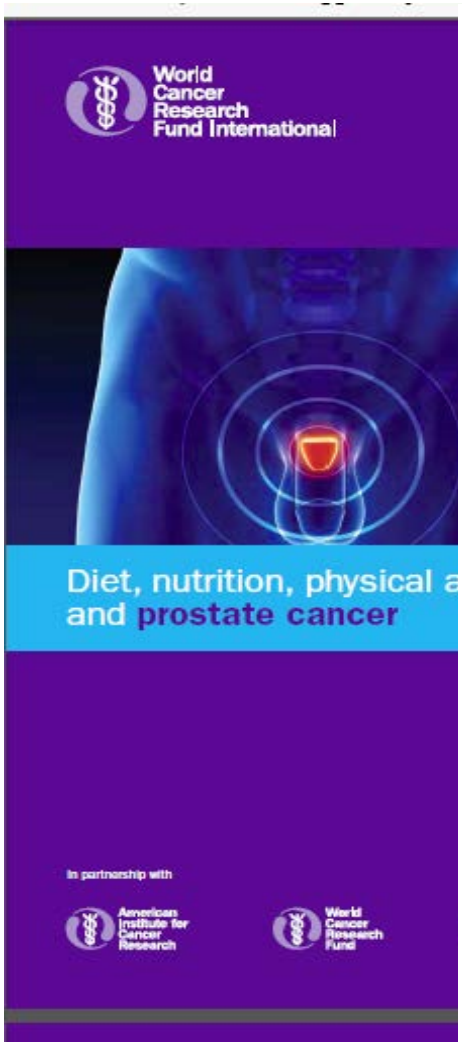
Dairy and prostate cancer



Increased risk of prostate cancer with high intakes of:

- Total dairy products
- Cheese
- Low-fat milk and skim milk combined
- Total calcium
- Dietary calcium
- Dairy calcium

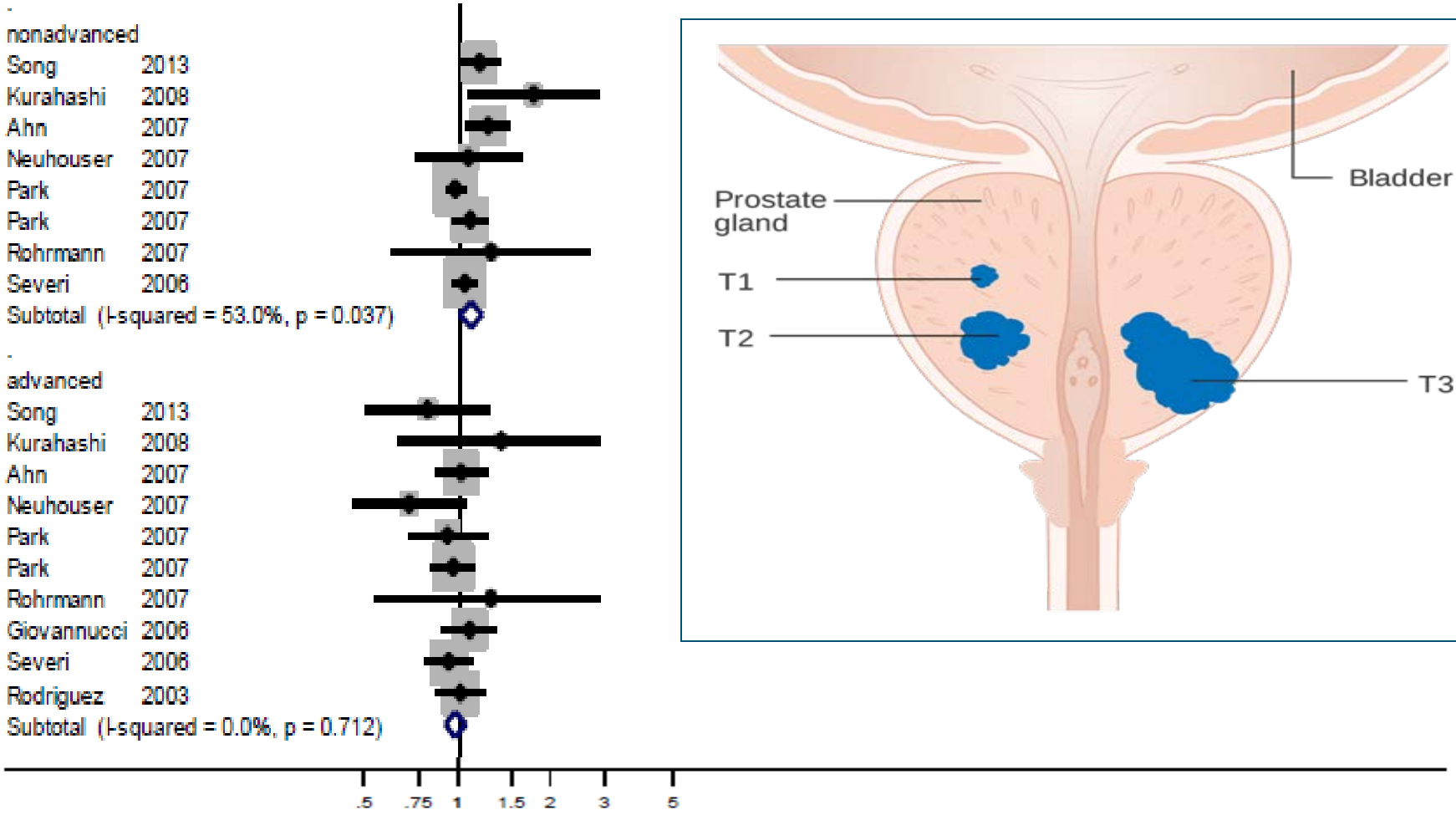
Decreased risk with high intakes of

- Whole milk

No association with high intakes of

- Skim milk
- Ice cream
- Butter

Dairy and type of prostate cancer



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WCRF/AICR CUP 2014; Aune et al. AJCN 2015

Dairy products and prostate cancer

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DIET, NUTRITION, PHYSICAL ACTIVITY AND PROSTATE CANCER

		DECREASES RISK	INCREASES RISK
STRONG EVIDENCE	Convincing		
	Probable		Body fatness (advanced prostate cancer)[1,2] Adult attained height[3]
LIMITED EVIDENCE	Limited-suggestive		Dairy products Diets high in calcium Low plasma alpha-tocopherol concentrations Low plasma selenium concentrations
	Limited-no conclusion	Cereals (grains) and their products, dietary fibre, potatoes, non-starchy vegetables, fruits, pulses (legumes), processed meat, red meat, poultry, fish, eggs, total fat, saturated fatty acids, monounsaturated fatty acids, polyunsaturated fatty acids, plant oils, sugar (sucrose), sugary foods and drinks, coffee, tea, alcoholic drinks, carbohydrate, protein, vitamin A, retinol, alpha carotene, lycopene, folate, thiamin, riboflavin, niacin, vitamin C, vitamin D, vitamin E supplements, gamma-tocopherol, multivitamins, selenium supplements, iron, phosphorus, calcium supplements, zinc, physical activity, energy expenditure, vegetarian diets, Seventh-day Adventist diets, individual dietary patterns, body fatness (non-advanced prostate cancer), birth weight, energy intake	
STRONG EVIDENCE	Substantial effect on risk unlikely	Beta-carotene[4,5]	

WA

Dairy and other types of cancer

FOOD, NUTRITION, PHYSICAL ACTIVITY AND BREAST CANCER (POSTMENOPAUSE) 2010

	DECREASES RISK	INCREASES RISK
Convincing	Lactation	Alcoholic drinks Body fatness Adult attained height[1]
Probable	Physical activity[2]	Abdominal fatness Adult weight gain

FOOD, NUTRITION, PHYSICAL ACTIVITY AND OVARIAN CANCER 2014

	DECREASES RISK	INCREASES RISK
Convincing		Adult attained height[1]
Probable		Body fatness[2]

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Recommendations for cancer prevention

Thus... Enjoy dairy and red meat...

By keeping to the recommended quantities