CANCER
Dietary Lycopene and Disease Risk

Brain Cancer- main findings

- Inconclusive

Summary of studies and outcomes

- Number of studies = 1
- Risk estimates = 1
  - (-) = 0
  - N = 0
  - (+) = 1

Table: Relationship between Dietary Lycopene and Risk for Brain Cancer

Study Type	N= studies	NEGATIVE ASSOCIATION (protective)					NEUTRAL ASSOCIATION (no associated risk or benefit)					POSTIVE ASSOCIATION (risk factor)				
Breast		Sample size, n=					Sample size, n=					Sample size, n=				
		≤100	101-200	201-500	501-1000	≥1000	≤100	101-200	201-500	501-1000	≥1000	≤100	101-200	201-500	501-1000	≥1000
RCT	0															
Interv	0															
PC	1															$\sqrt{_{Lyc}}$
CC	0															
Cross Sec	0															
Eco	0															

$\sqrt{_{Lyc}}$ *Relationship between dietary lycopene and Brain cancer.*

Breast Cancer- main findings

- Data support a neutral, although potentially protective, relationship between dietary lycopene and breast cancer risk

Summary of studies and outcomes

- Number of studies = 17
- Risk estimates = 18
  - (-) = 6
  - N = 12

Table: Relationship between Dietary Lycopene and Risk for Breast Cancer

Study Type	N= studies	NEGATIVE ASSOCIATION (protective)					NEUTRAL ASSOCIATION (no associated risk or benefit)					POSTIVE ASSOCIATION (risk factor)				
Breast		Sample size, n=					Sample size, n=					Sample size, n=				
		≤100	101-200	201-500	501-1000	≥1000	≤100	101-200	201-500	501-1000	≥1000	≤100	101-200	201-500	501-1000	≥1000
RCT	0															
Interv	0															
PC	4						√Lyc				√Lyc √Lyc √Lyc					
CC	11	√Lyc	√Lyc	√Lyc √Lyc		√Lyc			√Lyc		√Lyc √Lyc √Lyc √Lyc √Lyc					
Cross Sec	2			√Lyc					√Lyc							
Eco	0															

√Lyc *Relationship between dietary lycopene and Breast cancer.*

Cervical Cancer- main findings

- Data suggest a protective relationship between dietary lycopene intake and cervical cancer; however studies are few with limited sample size and the p-value for 1 'protective' inferring risk estimate was modest (p=0.10).

Summary of studies and outcomes

- Number of studies = 2
- Risk estimates = 3
  - (-) = 3
- Risk estimates by Tomato or Lycopene category
  - √GT G. Tom = 1 (-)
  - √Lyc Lyco = 2 (-)

Table: Relationship between Dietary Lycopene and Risk for Cervical Cancer

Study Type	N= studies	NEGATIVE ASSOCIATION (protective)					NEUTRAL ASSOCIATION (no associated risk or benefit)					POSTIVE ASSOCIATION (risk factor)				
Cervical		Sample size, n=					Sample size, n=					Sample size, n=				
		≤100	101-200	201-500	501-1000	≥1000	≤100	101-200	201-500	501-1000	≥1000	≤100	101-200	201-500	501-1000	≥1000
RCT	0															
Interv	0															
PC	0															
CC	2	√Lyc	√GT √Lyc													
Cross Sec	0															
Eco	0															

** More than 1 risk estimate may be derived from a study within a study type.*

Colorectal Cancer- main findings

Data support a neutral association between dietary lycopene and colorectal cancer risk; however 2 relatively large observational studies are suggesting a risk relationship associated dietary lycopene intake. These findings require follow up.

Summary of studies and outcomes

- Number of studies = 13
- Risk estimates = 14
  - (-) = 3
  - N = 9
  - (+) = 2

Table: Relationship between Dietary Lycopene and Risk for Colorectal Cancer

Study Type	N= studies	NEGATIVE ASSOCIATION (protective)					NEUTRAL ASSOCIATION (no associated risk or benefit)					POSTIVE ASSOCIATION (risk factor)				
Colorectal		Sample size, n=					Sample size, n=					Sample size, n=				
		≤100	101-200	201-500	501-1000	≥1000	≤100	101-200	201-500	501-1000	≥1000	≤100	101-200	201-500	501-1000	≥1000
RCT	0															
Interv	0															
PC	3							$\surd_{Lyc}$			$\surd_{Lyc}$ $\surd^{*}_{Lyc}$					$\surd^{*}_{Lyc}$
CC	10	$\surd_{Lyc}$		$\surd_{Lyc}$	$\surd_{Lyc}$				$\surd_{Lyc}$ $\surd_{Lyc}$ $\surd_{Lyc}$	$\surd_{Lyc}$	$\surd_{Lyc}$ $\surd_{Lyc}$				$\surd_{Lyc}$	
Cross Sec	0															
Eco	0															

$\surd_{Lyc}$ *Relationship between dietary lycopene and colorectal cancer.*
$\surd^{*}_{Lyc}$ *Asterisk indicate same study. Positive relationship is specific to rectal cancer in men.*

Endometrial Cancer- main findings

- Data indicate a neutral relationship between dietary lycopene and endometrial cancer risk.

Summary of studies and outcomes

- Number of studies = 4
- Risk estimates = 4
    - (-) = 1
    - N = 3

Table: Relationship between Dietary Lycopene and Risk for Endometrial Cancer

Study Type	N= studies	NEGATIVE ASSOCIATION (protective)					NEUTRAL ASSOCIATION (no associated risk or benefit)					POSTIVE ASSOCIATION (risk factor)				
Endometrial		Sample size, n=					Sample size, n=					Sample size, n=				
		≤100	101-200	201-500	501-1000	≥1000	≤100	101-200	201-500	501-1000	≥1000	≤100	101-200	201-500	501-1000	≥1000
RCT	0															
Interv	0															
PC	1								$\surd_{Lyc}$							
CC	3			$\surd_{Lyc}$					$\surd_{Lyc}$	$\surd_{Lyc}$						
Cross Sec	0															
Eco	0															

$\surd_{Lyc}$ *Relationship between dietary lycopene and Endometrial cancer.*

Gastric/oral (Upper GI) Cancer- main findings

- Data support a neutral, potentially protective relationship for some people between dietary lycopene and gastric/upper GI cancer.

Summary of studies and outcomes

- Number of studies = 11
- Risk estimates = 11
  - (-) = 4
  - N = 7

Table: Relationship between Dietary Lycopene and Risk for Gastric & Upper GI Cancer

Study Type	N= studies	NEGATIVE ASSOCIATION (protective)					NEUTRAL ASSOCIATION (no associated risk or benefit)					POSTIVE ASSOCIATION (risk factor)				
Gastric/oral/ (Upper GI)		Sample size, n=					Sample size, n=					Sample size, n=				
		≤100	101-200	201-500	501-1000	≥1000	≤100	101-200	201-500	501-1000	≥1000	≤100	101-200	201-500	501-1000	≥1000
RCT	0															
Interv	0															
PC	4			$\surd_{Lyc}$				$\surd_{Lyc}$	$\surd_{Lyc}$ $\surd_{FV}$							
CC	7		$\surd_{Lyc}$	$\surd_{Lyc}$		$\surd_{Lyc}$		$\surd_{Lyc}$	$\surd_{Lyc}$ $\surd_{Lyc}$ $\surd_{Lyc}$							
Cross Sec	0															
Eco	0															

$\surd_{Lyc}$ *Relationship between dietary lycopene and gastric/upper GI cancer.*
$\surd_{FV}$ *Relationship with disease based on fruits and vegetables considered rich in lycopene.*

Lung Cancer- main findings

- Data support a neutral, although favoring protective, relationship between dietary lycopene and lung cancer.

Summary of studies and outcomes

- Number of studies = 6
- Risk estimates = 6
  - (-) = 2
  - N = 4

Table: Relationship between Dietary Lycopene and Risk for Lung Cancer

Study Type	N= studies	NEGATIVE ASSOCIATION (protective)					NEUTRAL ASSOCIATION (no associated risk or benefit)					POSTIVE ASSOCIATION (risk factor)				
Lung		Sample size, n=					Sample size, n=					Sample size, n=				
		≤100	101-200	201-500	501-1000	≥1000	≤100	101-200	201-500	501-1000	≥1000	≤100	101-200	201-500	501-1000	≥1000
RCT	0															
Interv	0															
PC	3				$\sqrt{}_{Lyc}$	$\sqrt{}_{Lyc}$				$\sqrt{}_{Lyc}$						
CC	3							$\sqrt{}_{Lyc}$ $\sqrt{}_{Lyc}$	$\sqrt{}_{Lyc}$							
Cross Sec	0															
Eco	0															

$\sqrt{}_{Lyc}$ *Relationship between dietary lycopene and lung cancer.*

Ovarian Cancer- main findings

- Data suggest that dietary lycopene is neutral in its association with ovarian cancer; however, processed tomato consumption may provide some level of protection.
- Menopausal status may be an important factor for determining benefit of lycopene/lycopene-rich foods.
    - One study suggested the benefit of dietary lycopene was specific to premenopausal women, whereas alpha-carotene was beneficial in postmenopausal women.

Summary of studies and outcomes

- Number of studies = 4

Risk estimates (RE) = 5

- (-) = 2
- N = 3

Risk estimates by Tomato or Lycopene category

- √PT P. Tom = 1 (-)
- √Lyc Lyco = 1 (-), 3 (N)

Table: Relationship between Dietary Lycopene and Risk for Ovarian Cancer

Study Type	N= studies	NEGATIVE ASSOCIATION (protective)					NEUTRAL ASSOCIATION (no associated risk or benefit)					POSTIVE ASSOCIATION (risk factor)				
Ovarian		Sample size, n=					Sample size, n=					Sample size, n=				
		≤100	101-200	201-500	50 -1000	≥1000	≤100	101-200	201-500	501-1000	≥1000	≤100	101-200	201-500	501-1000	≥1000
RCT	0															
Interv	0															
PC	1										√Lyc					
CC	3				√* PT √* Lyc				√Lyc		√Lyc					
Cross Sec	0															
Eco	0															

** More than 1 risk estimate may be derived from a study within a study type.*

Pancreatic Cancer - main findings

- The data indicate a limited possible protective association between dietary lycopene, and tomatoes as a source of lycopene, and pancreatic cancer. Data are limited.

Summary of studies and outcomes

- Number of studies = 2
- Risk estimate (RE): 3
  - (-) = 2
  - N = 1
- Risk estimates by Tomato or Lycopene category
  - √GT G. Tom = 1 (-)
  - √Lyc Lyco = 1 (-), 1 (N)

Table: Relationship between Dietary Lycopene and Risk for Pancreatic Cancer

Study Type	N= studies	NEGATIVE ASSOCIATION (protective)					NEUTRAL ASSOCIATION (no associated risk or benefit)					POSTIVE ASSOCIATION (risk factor)				
Pancreatic		Sample size, n=					Sample size, n=					Sample size, n=				
		≤100	101-200	201-500	50 -1000	≥1000	≤100	101-200	201-500	501-1000	≥1000	≤100	101-200	201-500	501-1000	≥1000
RCT	0															
Interv	0															
PC	0															
CC	2			$\sqrt{}_{Lyc}$ $\sqrt{}_{GT}$				$\sqrt{}_{Lyc}$								
Cross Sec	0															
Eco	0															

** More than 1 risk estimate may be derived from a study within a study type.*

Prostate Cancer- main findings

- Data may support a protective relationship between dietary lycopene intake and prostate cancer risk.
- Tomatoes (as a general category) or processed tomatoes (specifically) are main sources of dietary lycopene and support a protective effect of tomato/lycopene-rich foods on prostate cancer.

Summary of studies and outcomes

- Number of studies = 15
- Risk estimates (RE) = 21
    - (-) = 13
    - N = 8
- Risk estimates by Tomato or Lycopene category
    - √GT G. Tom = 4 (-)
    - √PT P. Tom = 2 (-)
    - √Lyc Lyco = 7 (-), 8 (N)

Table: Relationship between Dietary Lycopene and Risk for Prostate Cancer

Study Type	N= studies	NEGATIVE ASSOCIATION (protective)					NEUTRAL ASSOCIATION (no associated risk or benefit)					POSTIVE ASSOCIATION (risk factor)				
Prostate		Sample size, n=					Sample size, n=					Sample size, n=				
		≤100	101-200	201-500	501-1000	≥1000	≤100	101-200	201-500	501-1000	≥1000	≤100	101-200	201-500	501-1000	≥1000
RCT	0															
Interv	0															
PC	4					√GT √PT √Lyc				√Lyc √Lyc	√Lyc					
CC	11	√*Lyc √*PT √*GT	√GT √Lyc √Lyc	√GT √Lyc √Lyc	√Lyc			√Lyc	√Lyc √Lyc	√Lyc √Lyc						
Cross Sec	0															
Eco	0															

** More than 1 risk estimate may be derived from a study within a study type.*

Renal Cell Cancer- main findings

- Data support a neutral relationship between dietary lycopene intake and renal cell cancer risk.

Summary of studies and outcomes

- Number of studies = 3
- Risk estimates (RE) = 3
    - N = 3
- Risk estimates by Tomato or Lycopene category
    - √GT G. Tom = 0
    - √PT P. Tom = 0
    - √Lyc Lyco = 3 (N)

Table: Relationship between Dietary Lycopene and Risk for Prostate Cancer

Study Type	N= studies	NEGATIVE ASSOCIATION (protective)					NEUTRAL ASSOCIATION (no associated risk or benefit)					POSTIVE ASSOCIATION (risk factor)				
Renal		Sample size, n=					Sample size, n=					Sample size, n=				
		≤100	101-200	201-500	501-1000	≥1000	≤100	101-200	201-500	501-1000	≥1000	≤100	101-200	201-500	501-1000	≥1000
RCT	0															
Interv	0															
PC	1										$\sqrt{}_{Lyc}$					
CC	2									$\sqrt{}_{Lyc}$	$\sqrt{}_{Lyc}$					
Cross Sec	0															
Eco	0															

** More than 1 risk estimate may be derived from a study within a study type.*

Uterine Cancer- main findings

- 1 PC study (n=6302 cases, cohort 82,512, Nurses' Health Study II)
  - RE: N

Mortality- main findings

Total Mortality (EPIC-Spain) [2007, 2008 publications – same data, different Journals]'

- PC study (n=562 deaths of ~ 41,000)
- RE: (-)