CANCER Dietary Lycopene and Disease Risk

Brain Cancer- main findings

• Inconclusive

Summary of studies and outcomes

Number of studies = 1

• Risk estimates = 1

 \circ (-) = 0

o N = 0

 \circ (+) = 1

Table: Relationship between Dietary Lycopene and Risk for Brain Cancer

Study Type	N= studies		ASS	GATI OCIAT rotectiv	TION			ASS (no	OCIA assoc or be	TION iated			ASS	OST SOCIA	ATION	
Breast			Sam	ole siz	e, n=			Sam	ole si	ze, n=			Sam	ple s	ize, 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						3		2							
Interv	0						2	3					5 9			
PC	1															VLyc
СС	0					500							8			
Cross Sec	0															
Eco	0					8										

^{√&}lt;sub>Lyc</sub> 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

o (-) = 6

o N = 12

Table: Relationship between Dietary Lycopene and Risk for Breast Cancer

Study Type	N= studies		NE ASS	GATI OCIAT rotectiv	VE FION			ASS (no	UTR	AL TION iated			ASS	OST	ATION	
Breast			Samp	ole siz	e, n=			Sam	ole si	ze, n=			Sam	ple s	ize, 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		# ·				9)									
Interv	0												S 55			
PC	4						√Lyc				VLyc VLyc VLyc					
сс	11	√Lyc	√Lyc	√Lyc √Lyc		VLyc			√Lyc		VLyc VLyc VLyc VLyc					
Cross Sec	2			VLyc					√Lyc		YLYC					
Eco	0															

^{√&}lt;sub>Lyc</sub> 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).

- Number of studies = 2
- Risk estimates = 3

- Risk estimates by Tomato or Lycopene category
 - o \sqrt{GT} G. Tom = 1 (-)
 - o √Lyc Lyco = 2 (-)

Table: Relationship between Dietary Lycopene and Risk for Cervical Cancer

Study Type	N= studies	NE	GATIV (p	E AS: protect		TION		ASS (no	asso	RAL ATION ciated enefit)			ASS	OSTI OCIA sk fac	TION	
Cervical			Sam	ple si	ze, n=			Sam	ple s	ize, n	:		Sam	ole si	ze, 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		3	37	3	Ø 8		9 6						27		
СС	2	√Lyc	V-GT V-Lyc		5	9		2							50 1	
Cross Sec	ross 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.

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

Table: Relationship between Dietary Lycopene and Risk for Colorectal Cancer

Study Type	N= studies		ASS	GAT OCIA rotect	TION			ASS (no	asso	RAL ATION ciated enefit)	I	РО		E ASS	SOCIA ctor)	TION
Colorectal			Sam	ple si	ze, n=			Sam	ple s	ize, n	=		Sam	ple s	ize, 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							√ _{Lyc}			√ _{Lyc} √* _{Lyc}			S		√*Lyc
СС	10	√Lyc		√Lyc	√Lyc				VLyc VLyc VLyc	√Lyc	√ _{Lyc}				√Lyc	
Cross Sec	0								.ju		6				0 0	
Eco	0															

Endometrial Cancer- main findings

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

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

^{√&}lt;sub>Lyc</sub> Relationship between dietary lycopene and colorectal cancer. √*_{Lyc} Asterisk indicate same study. Positive relationship is specific to rectal cancer in men.

Table: Relationship between Dietary Lycopene and Risk for Endometrial Cancer

Study Type	N= studies		ASS	EGAT SOCIA protect	ATION			ASS (no		ATION ciated			ASS	OSTI OCIA sk fact	TION	
Endometrial		3	Sam	ple s	ize, n=	:		Sam	ple s	ize, n	= 0		Sam	ole si	ze, n=	23
		≤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		3	3	3	3	3 - 3		9	3	3	3					
PC	1								√Lyc							
СС	3			√Lyc		92 2			√Lyc	√ _{Lyc}						10
Cross Sec	0															3
Eco								50 11								

^{√&}lt;sub>Lyc</sub> 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.

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

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

Study Type	N= studies		ASS	GAT OCIA rotect	TION			ASS (no	asso	RAL ATION ciated enefit)			ASS	OST OCI/ isk fac	ATION	
Gastric/oral/ (Upper GI)			Sam	ple s	ze, n=			Sam	ple s	ize, n			Sam	ple s	ize, 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										62.					
Interv	0										200					
PC	4			√ _{Lyc}				√Lyc	√Lyc √FV							
СС	7		√ _{Lyc}	√Lyc		√ _{Lyc}		$\sqrt{_{\rm Lyc}}$	VLyc VLyc VLyc							
Cross Sec	0							÷	Lyc							
Eco	0															

Lung Cancer- main findings

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

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

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

Table: Relationship between Dietary Lycopene and Risk for Lung Cancer

Study Type	N= studies		AS		TIVE ATION	N		ASS (no		ATION ciated	Ē.		ASS	OSTI OCIA sk fact	TION	
Lung			San	nple s	size, n	=		Sam	ple s	ize, n			Sam	ole si	ze, n=	i i
		≤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				√Lyc	V _{Lyc}				√Lyc						
СС	3							√Lyc √Lyc	VLyc							
Cross Sec	0															
Eco	0							9	0							

V_{Lvc} 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

- $\sqrt{PT} P. Tom = 1 (-)$
- $\sqrt{\text{Lyc Lyco}} = 1 (-), 3 (N)$

Table: Relationship between Dietary Lycopene and Risk for Ovarian Cancer

Study Type	N= studies		ASS	EGAT SOCIA protect	TIVE			ASS (no	asso	RAL ATION ciated enefit)			ASS	OSTI OCIA sk fac	TION	
Ovarian			Sam	ple s	ize, n			Sam	ple s	ize, n			Sam	ole si	ze, 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										4					
Interv	nterv 0									.9	3	3				
PC	1										√ _{Lyc}					
СС	3				√* pT √* Lyc				VLyc		VLyc					
Cross Sec	0	√* _{Lyc}														
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.

- Number of studies = 2
- Risk estimate (RE): 3
 - o (-) = 2
 - \circ N=1
- Risk estimates by Tomato or Lycopene category
 - o \sqrt{GT} G. Tom = 1 (-)
 - o $\sqrt{\text{Lyc Lyco}} = 1$ (-), 1 (N)

Table: Relationship between Dietary Lycopene and Risk for Pancreatic Cancer

Study Type	N= studies		ASS	EGAT SOCIA protect	TION			ASS (no	asso	RAL ATION ciated enefit)			ASS	OSTI OCIA sk fact	TION	
Pancreatic			Sam	ple s	ze, n					ize, n			Samp	ole si	ze, 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								3-		4*					
Interv	0	3	3	.9						18	.ej		.9	3	.9	
PC	0															
СС	2	8	3	√Lyc √GT				√ _{Lyc}			10		3	3	0	
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.

- Number of studies = 15
- Risk estimates (RE) = 21
 - o (-) = 13
 - o N = 8
- Risk estimates by Tomato or Lycopene category
 - o \sqrt{GT} G. Tom = 4 (-)
 - o \sqrt{PT} P. Tom = 2 (-)
 - \circ $\sqrt{\text{Lyc Lyco}} = 7$ (-), 8 (N)

Table: Relationship between Dietary Lycopene and Risk for Prostate Cancer

Study Type	N= studies		ASS	GAT OCIA rotect	TION			ASS (no		ATION ciated			ASS	OSTI\ OCIA sk fact	TION	
Prostate			Sam	ple si	ze, n=	:		Sam	ple s	ize, n			Samp	ole si	ze, n=	
		≤100	101-200	201-500	501-10 <mark>00</mark>	≥10 <mark>0</mark> 0	≤100	101-200	201-500	501-1000	≥1000	≤100	101-200	201-500	501-1000	≥1000
RCT	0															
Interv	0															
PC	4					V _{GT} √ _{PT} √ _{Lyc}	8 8			√Lyc √Lyc	√Lyc					
СС	11	√*Lyc √*pT √*GT	V _{GT} V _{Lyc}	V _{GT} V _{Lyc}	√Lyc			√Lyc	√Lyc √Lyc	√Lyc √Lyc						
Cross Sec	0			Accepted a												
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.

- Number of studies = 3
- Risk estimates (RE) = 3
 - o N = 3
- Risk estimates by Tomato or Lycopene category
 - o \sqrt{GT} G. Tom = 0
 - \sqrt{PT} P. Tom = 0
 - o $\sqrt{\text{Lyc Lyco}}$ = 3 (N)

Table: Relationship between Dietary Lycopene and Risk for Prostate Cancer

Study Type	N= studies		ASS	GAT OCIA rotect	TION			ASS (no		ATION ciated			ASS	OSTI OCIA sk fact	TION	
Renal			Sam	ple si	ze, n=			Sam	ple s	ize, n			Samp	ole si	ze, n=	9
		≤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								3	(3)	3					
PC	1										√Lyc					
СС	2								8	√Lyc	VLyc					B
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: (-)