Supprenentary rapic r Deministry of Science Characters	Supplementary	Table 1	Definition	of selected	characters.
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Variables	Definition
Smoking	Smokers were those who have smoked at least one cigarette per day for 6 months or more and categorized as yes and
Shloking	no.
Alashal drintring	Alcohol drinkers were those who have drunk alcohol at least once a week for 6 months or more and categorized as yes
Alconol drinking	and no.
Tea drinking	Tea drinkers were those who have drunk tea at least once a week for 6 months or more and categorized as yes and no.
Dietary change	A change of diet habits before diagnosis and categorized as yes and no.
	Physical activity (in metabolic equivalent hours per day (MET-hours/day)) was estimated using the updated 2011
Physical activity	Compendium of Physical Activities, based on work, commuting, household chores, and leisure-time exercise.

Characteristics	No. of deaths/total (%)	Adjusted HR * (95%CI)		
Age at diagnosis				
≤50	39/232 (16.81)	1.00 (Ref)		
>50	75/403 (18.61)	1.21 (0.71, 2.07)		
Histological type				
Serous	80/430 (18.60)	1.00 (Ref)		
Non-serous	34/205 (16.59)	0.83 (0.39, 1.78)		
Histopathologic grade				
Well differentiated	4/47 (8.51)	1.00 (Ref)		
Moderately differentiated	7/44 (15.91)	2.33 (0.31, 17.48)		
Poorly differentiated	103/522 (19.73)	3.65 (0.42, 31.48)		
FIGO stage				
I-II	37/306 (12.09)	1.00 (Ref)		
III-IV	77/307 (25.08)	2.79 (1.51, 5.16)		
Residual lesions				
No	74/499 (14.83)	1.00 (Ref)		
<1 cm	28/99 (28.28)	2.12 (1.08, 4.15)		
≥1 cm	12/37 (32.43)	3.11 (1.39, 6.98)		
Comorbidities				
No	64/355 (18.03)	1.00 (Ref)		
Yes	50/280 (18.86)	0.78 (0.47, 1.29)		
Vimentin expression				
Negative	53/319 (16.61)	1.00 (Ref)		

Supplementary Table 2 Selected clinical characteristics and associations with total mortality among ovarian cancer patients (N=635).

Positive	27/142 (19.01)	1.20 (0.66, 2.19)	
PR expression			
Negative	54/238 (22.69)	1.00 (Ref)	
Positive	42/290 (14.48)	0.73 (0.41, 1.31)	
ER expression			
Negative	26/117 (22.22)	1.00 (Ref)	
Positive	70/411 (17.03)	0.52 (0.24, 1.11)	
WT-1 expression			
Negative	38/168 (22.62)	1.00 (Ref)	
Positive	51/342 (14.91)	0.45 (0.24, 0.85)	
P53 expression			
Negative	23/139 (16.55)	1.00 (Ref)	
Positive	81/423 (19.15)	1.45 (0.78, 2.71)	

CI, confidence interval; ER, Estrogen Receptor; HR, hazard ratio; PR, Progesterone Receptor; Ref, reference. WT-1, Wilms' tumour-1.

Mutually adjusted for all other variables listed in the		Mutually adjusted	for	all	other	variables	listed	1 n	the	tat
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Supplementary Table 3 Relative excess risk due to interaction (RERI) and 95% confidence interval (CI) for additive interaction between selected factors and dietary fat-soluble choline, water-soluble choline, total choline, and betaine intake.

		RERI (95% CI) **								
Selected factors	Higher fat-soluble choline *	Higher water-soluble choline *	Higher total choline *	Higher betaine *						
	(>154.72 mg/day)	(>45.86 mg/day)	(>275.04 mg/day)	(>49.22 mg/day)						
Age at diagnosis (years) (>50)	-0.63 (-2.32, 1.06)	-1.28 (-3.84, 1.27)	-0.40 (-1.81, 1.01)	-0.11 (-1.11, 0.89)						
Body mass index (kg/m²) (≥25)	0.09 (-0.23, 0.40)	0.10 (-0.35, 0.52)	0.06 (-0.2, 0.38)	-0.03 (-0.39, 0.33)						
Menopausal status (Yes)	0.18 (-0.48, 0.85)	-0.08 (-0.88, 0.72)	0.48 (0.06, 0.90)	-0.29 (-1.32, 0.75)						
Alcohol drinking (Yes)	0.40 (-0.10, 0.91)	-0.24 (-1.75, 1.27)	0.29 (-0.41, 0.99)	0.44 (0.10, 0.78)						
Histological type (non-serous)	-0.85 (-3.35, 1.65)	0.47 (-0.09, 1.04)	-0.28 (-1.92, 1.37)	-0.19 (-1.75, 1.37)						
FIGO stage (III-IV)	0.14 (-0.86, 1.15)	0.57 (0.09, 1.04)	0.26 (-0.58, 1.11)	-0.31 (-1.99, 1.38)						
Residual lesions (Yes)	0.36 (-0.23, 0.95)	0.44 (-0.02, 0.90)	0.35 (-0.25, 0.94)	0.45 (-0.03, 0.93)						
Vimentin expression (Positive)	0.08(-1.04, 1.19)	-3.32 (-10.22, 3.58)	-2.64 (-8.14, 2.87)	0.03 (-1.03, 1.09)						
PR expression (Positive)	0.22 (-0.29, 0.73)	-0.47 (-1.64, 0.70)	0.37 (-0.02, 0.76)	0.28 (-0.15, 0.71)						
ER expression (Positive)	0.62 (0.28, 0.95)	0.07 (-0.68, 0.83)	0.39 (-0.13, 0.91)	0.11 (-0.64, 0.87)						
WT_1 expression (Positive)	0.64 (0.39, 0.89)	0.25 (-0.26, 0.77)	0.44 (0.04, 0.84)	0.35 (-0.08, 0.78)						
P53 expression (Positive)	0.02 (-1.04, 1.08)	-0.59 (-2.32, 1.14)	-0.74 (-2.84, 1.36)	-1.32 (-4.27, 1.63)						

CI, confidence interval; ER, Estrogen Receptor; HR, hazard ratio; PR, Progesterone Receptor; Ref, reference; RERI, relative excess risk due to interaction; WT-1, Wilms' tumour-1.

*Adjusted for energy by the residual method.

** Test for interaction based on strata and dietary fat-soluble choline, water-soluble choline, total choline, and betaine intake.

Supplementary Table 4 Relative excess risk due to interaction (RERI) and 95% confidence interval (CI) for additive interaction between selected factors and dietary choline-containing compounds intake.

			RERI (95% CI) **		
Selected factors	Higher phosphatidylcholine * (>144.83 mg/day)	Higher sphingomyelin * (>10.17 mg/day)	Higher free choline * (>21.96 mg/day)	Higher glycerophospho- choline * (>15.59 mg/day)	Higher phosphocholine * (>6.33 mg/day)
Age at diagnosis (years) (>50)	-0.66 (-2.40, 1.07)	-0.24 (-1.43, 0.95)	-0.66 (-2.43, 1.10)	-0.02 (-0.78, 0.73)	-1.08 (-3.37, 1.20)
Body mass index (kg/m ²) (≥25)	0.09 (-0.23, 0.40)	0.07 (-0.27, 0.40)	0.09 (-0.22, 0.40)	-0.03 (-0.54, 0.49)	0.07 (-0.31, 0.44)
Menopausal status (Yes)	0.17 (-0.50, 0.85)	0.19 (-0.45, 0.84)	-0.24 (-1.33, 0.85)	0.34 (-0.09, 0.77)	0.04 (-0.69, 0.77)
Alcohol drinking (Yes)	0.40 (-0.10, 0.90)	0.52 (0.23, 0.82)	-1.94 (-6.11, 2.23)	-0.31 (-2.03, 1.40)	-0.32 (-1.94, 1.30)
Histological type (non-serous)	-0.89 (-3.45, 1.67)	-0.11 (-1.54, 1.31)	0.32 (-0.41, 1.05)	0.57 (0.01, 1.10)	0.53 (0.12, 0.94)
FIGO stage (III-IV)	0.15 (-0.84, 1.14)	0.50 (-0.04, 1.04)	0.51 (-0.01, 1.03)	0.58 (-0.47, 1.63)	0.42 (-0.23, 1.06)
Residual lesions (Yes)	0.37 (-0.22, 0.95)	0.59 (0.19, 0.98)	0.12 (-0.65, 0.89)	0.28 (-0.17, 0.74)	0.17 (-0.47, 0.81)
Vimentin expression (Positive)	0.12 (-0.92, 1.16)	0.11 (-0.93, 1.15)	-2.74 (-8.61, 3.14)	-0.50 (-2.54, 1.53)	-0.45 (-2.41, 1.51)
PR expression (Positive)	0.21 (-0.31, 0.72)	0.25 (-0.21, 0.71)	0.24 (-0.33, 0.80)	-0.62 (-1.68, 0.45)	-0.25 (-1.24, 0.74)
ER expression (Positive)	0.60 (0.26, 0.94)	0.41 (-0.08, 0.91)	0.52 (0.10, 0.94)	0.02 (-0.72, 0.77)	0.32 (-0.25, 0.89)
WT-1 expression (Positive)	0.65 (0.40, 0.89)	0.45 (0.08, 0.83)	0.59 (0.30, 0.89)	-0.45 (-1.38, 0.48)	0.00 (-0.74, 0.74)
P53 expression (Positive)	0.00 (-1.09, 1.09)	-0.32 (-1.82, 1.18)	-2.43 (-7.20, 2.33)	0.05 (-0.63, 0.74)	-0.37 (-1.89, 1.16)

CI, confidence interval; ER, Estrogen Receptor; HR, hazard ratio; PR, Progesterone Receptor; Ref, reference; RERI, relative excess risk due to interaction; WT-1, Wilms' tumour-1.

* Adjusted for energy by the residual method.

**	Test	for	interaction	based	on	strata	and	dietary	choline-containing	compounds	intake.
								2	U	1	

Characteristics	Terti	les of energy-adjusted int	ake **	Continuous †	P trend ‡
	Ι	II	III	Continuous	1 trenu
Free choline (Range, mg/d)	<19.71	l 19.71-24.45 24.45			
Deaths, N (% of total deaths)	26 (32.91)	28 (35.44)	25 (31.65)		
model 1	1.00 (Ref)	1.12 (0.66, 1.91)	0.80 (0.46, 1.39)	0.95 (0.73, 1.23)	0.40
model 2	1.00 (Ref)	1.28 (0.74, 2.22)	0.77 (0.44, 1.34)	0.93 (0.72, 1.19)	0.30
model 3	1.00 (Ref)	1.16 (0.66, 2.03)	0.78 (0.44, 1.38)	0.91 (0.70, 1.18)	0.35
Glycerophosphocholine (Range, mg/d)	<13.13	13.13-17.55	17.55-64.38		
Deaths, N (% of total deaths)	26 (32.91)	26 (32.91)	27 (34.18)		
model 1	1.00 (Ref)	0.87 (0.50, 1.50)	0.96 (0.56, 1.65)	1.04 (0.84, 1.28)	0.95
model 2	1.00 (Ref)	0.97 (0.54, 1.74)	0.96 (0.55, 1.67)	1.04 (0.85, 1.28)	0.90
model 3	1.00 (Ref)	1.05 (0.58, 1.90)	0.97 (0.56, 1.70)	1.07 (0.86, 1.32)	0.89
Phosphocholine (Range, mg/d)	<5.28	5.28-7.53	7.53-17.21		
Deaths, N (% of total deaths)	29 (36.71)	22 (27.85)	28 (35.44)		
model 1	1.00 (Ref)	0.70 (0.40, 1.23)	0.88 (0.52, 1.47)	0.87 (0.65, 1.16)	0.69
model 2	1.00 (Ref)	0.70 (0.40, 1.23)	0.82 (0.48, 1.39)	0.87 (0.66, 1.14)	0.52
model 3	1.00 (Ref)	0.73 (0.41, 1.31)	0.86 (0.50, 1.48)	0.88 (0.66, 1.16)	0.65
Phosphatidylcholine (Range, mg/d)	<116.99	116.99-171.96	171.96-362.92		
Deaths, N (% of total deaths)	32 (40.51)	32 (40.51)	15 (18.99)		
model 1	1.00 (Ref)	0.90 (0.55, 1.48)	0.43 (0.23, 0.79)	0.71 (0.52, 0.96)	0.01
model 2	1.00 (Ref)	0.81 (0.49, 1.34)	0.40 (0.22, 0.75)	0.72 (0.53, 0.97)	0.00

Supplementary Table 5 Adjusted hazard ratio (HR) and 95% confidence interval (CI) for total mortality by total choline, individual choline-containing compounds and betaine intake after removing deaths occurring in 1 year of follow-up (N=600).

model 3	1.00 (Ref)	0.84 (0.50, 1.41)	0.41 (0.22, 0.78)	0.73 (0.54, 0.99)	0.01
Sphingomyelin (Range, mg/d)	<8.47	8.47-12.14	12.14-22.64		
Deaths, N (% of total deaths)	29 (36.71)	31 (39.24)	19 (24.05)		
model 1	1.00 (Ref)	1.02 (0.61, 1.70)	0.61 (0.34, 1.10)	0.78 (0.58, 1.03)	0.10
model 2	1.00 (Ref)	1.00 (0.60, 1.68)	0.63 (0.35, 1.14)	0.80 (0.61, 1.06)	0.12
model 3	1.00 (Ref)	1.11 (0.66, 1.89)	0.68 (0.38, 1.23)	0.83 (0.63, 1.10)	0.20
Water-soluble choline (Range, mg/d)	<39.63	39.63-49.27	49.27-117.37		
Deaths, N (% of total deaths)	26 (32.91)	24 (30.38)	29 (36.71)		
model 1	1.00 (Ref)	0.85 (0.48, 1.48)	0.98 (0.58, 1.67)	0.98 (0.77, 1.25)	0.99
model 2	1.00 (Ref)	0.86 (0.48, 1.54)	0.94 (0.55, 1.61)	0.97 (0.77, 1.23)	0.86
model 3	1.00 (Ref)	0.87 (0.48, 1.57)	0.92 (0.53, 1.59)	0.98 (0.77, 1.24)	0.80
Fat-soluble choline (Range, mg/d)	<125.22	125.22-183.84	183.84-389.56		
Deaths, N (% of total deaths)	31 (39.24)	33 (41.77)	15 (18.99)		
model 1	1.00 (Ref)	0.94 (0.57, 1.54)	0.43 (0.23, 0.81)	0.71 (0.52, 0.97)	0.01
model 2	1.00 (Ref)	0.86 (0.52, 1.43)	0.41 (0.22, 0.77)	0.73 (0.54, 0.98)	0.01
model 3	1.00 (Ref)	0.89 (0.53, 1.49)	0.42 (0.22, 0.80)	0.74 (0.55, 1.01)	0.01
Total Choline (Range, mg/d)	<245.60	245.60-310.02	310.02-523.38		
Deaths, N (% of total deaths)	32 (40.51)	31 (39.24)	16 (20.25)		
model 1	1.00 (Ref)	0.89 (0.54, 1.47)	0.45 (0.25, 0.83)	0.72 (0.55, 0.95)	0.01
model 2	1.00 (Ref)	0.79 (0.48, 1.32)	0.40 (0.21, 0.74)	0.71 (0.55, 0.93)	0.00
model 3	1.00 (Ref)	0.76 (0.45, 1.28)	0.39 (0.21, 0.73)	0.73 (0.55, 0.96)	0.00
Betaine (Range, mg/d)	<41.35	41.35-61.55	61.55-361.14		
Deaths, N (% of total deaths)	23 (29.11)	26 (32.91)	30 (37.97)		
model 1	1.00 (Ref)	1.01 (0.58, 1.78)	1.24 (0.72, 2.14)	1.02 (0.83, 1.25)	0.40

model 2	1.00 (Ref)	1.17 (0.65, 2.11)	1.32 (0.76, 2.30)	1.01 (0.83, 1.23)	0.34
model 3	1.00 (Ref)	1.14 (0.63, 2.04)	1.29 (0.74, 2.25)	0.99 (0.82, 1.21)	0.38

CI, confidence interval; HR, hazard ratio; Ref, reference.

* HR and 95% CI were calculated with the use of the Cox proportional hazards regression model.

** Adjusted for energy by the residual method.

[†] Continuous intakes were calculated by per unit increase.

‡ Test for trend based on variables containing the median value for each tertile.

Model 1 adjusted for age at diagnosis and body mass index.

Model 2 adjusted for age at diagnosis, total energy intake, body mass index, alcohol drinking, diet change, education, income, physical activity, menopausal status, parity.

Model 3 adjusted for age at diagnosis, total energy intake, body mass index, alcohol drinking, diet change, education, income, physical activity, menopausal status, parity, comorbidities, FIGO stage, histological type, histopathologic grade, and residual lesions.



Supplementary Figure 1 Kaplan-Meier survival curves for phosphatidylcholine (A), sphingomyelin (B), free choline (C),glycerophosphocholine(D),andphosphocholineintake(E).

Characteristics	Cases	Fat-	soluble choline intake	HR (95% CI)	P for interaction	Water-soluble choline intake	HR (95% CI)	P for interaction	Total choline intake	HR (95% CI)	P for interaction	Total betaine intake	HR (95% CI)	P for interaction
Age at diagnosis (yea	ars)				0.38			0.62			0.55			0.84
≤50	232		• · · · · ·	0.78 (0.31-1.97)		••••••	1.54 (0.66-3.59)		⊢ ∙ ₊ →	0.74 (0.30-1.85)		· · · · ·	1.11 (0.44-2.83)	
>50	403			0.49 (0.26-0.91)		⊢ 4 →	0.96 (0.55-1.67)		H -	0.41 (0.22-0.76)		⊢ _ ●i	1.11 (0.63-1.96)	
Body mass index (kg	/m ²)				0.97			0.52			0.86			0.96
<25	164		<u>+</u>	0.63 (0.36-1.11)			1.03 (0.60-1.77)		H•	0.51 (0.29-0.89)			1.09 (0.62-1.93)	
≥25	471		∔ ⊸i	0.42 (0.12-1.48)		⊢ ∔ ∙	1.18 (0.42-3.27)		⊢ ●	0.56 (0.18-1.72)		⊢ − ● <mark> </mark> −−−−−−	0.86 (0.32-2.35)	
Menopausal status					0.74			0.16			0.87			0.41
Premenopausal	178		1	0.38 (0.11-1.24)		⊢ }	1.04 (0.39-2.72)		⊢● ‡'	0.34 (0.10-1.14)		· •	1.07 (0.38-3.01)	
Postmenopausal	457		4	0.57 (0.32-1.02)			1.16 (0.67-1.98)		H•	0.52 (0.29-0.92)		·	1.09 (0.63-1.89)	
Alcohol drinking					0.16			0.54			0.49			0.71
No	126	H•		0.47 (0.27-0.83)		· † • · · · · ·	1.36 (0.80-2.31)		H•	0.48 (0.27-0.85)		⊢ _ •	1.13 (0.66-1.93)	
Yes	509		÷	1.02 (0.28-3.76)		⊢● ∔ →	0.60 (0.22-1.64)		⊢ ●	0.66 (0.17-2.59)		⊢	1.04 (0.32-3.34)	
Histological type					0.32			0.13			0.95			0.39
Serous	430		<u>+</u>	0.69 (0.37-1.30)		⊢• ¦	0.86 (0.48-1.52)		H•	0.50 (0.28-0.92)		· + • · · · · · ·	1.31 (0.75-2.29)	
Non-serous	205			0.26 (0.10-0.73)		•	- 2.00 (0.84-4.75)		⊢ ●∔ ⊣	0.42 (0.14-1.25)		⊢ ●	0.74 (0.28-1.97)	
FIGO stage					0.48			0.33			0.36			0.70
I-II	306	H H		0.28 (0.10-0.79)		, •	0.92 (0.42-2.00)		•• I	0.23 (0.09-0.62)		⊢ ,	0.98 (0.37-2.58)	
III-IV	307		∔ ⊣	0.69 (0.38-1.27)		⊢∔● i	1.31 (0.72-2.36)		⊢ •—∔	0.56 (0.30-1.03)		⊢ ∔ ●−−−−−1	1.17 (0.67-2.04)	
Residual lesions					0.23			0.03			0.06			0.35
No	280	H -		0.35 (0.19-0.66)		⊢ •−−−−	1.09 (0.62-1.92)		H •	0.41 (0.22-0.76)		⊢ 	0.95 (0.53-1.73)	
Yes	355		· · · · · · · · · · · · · · · · · · ·	1.25 (0.50-3.13)		⊢∔∙ ───	1.26 (0.57-2.79)		⊢ ● ∔ →	0.66 (0.26-1.68)		⊢ ∎	1.32 (0.59-2.98)	
Vimentin expression	1				0.4			0.64			0.37			0.37
Negative	319		+	0.50 (0.24-1.04)		·	1.76 (0.85-3.62)		⊢●]	0.50 (0.24-1.01)		· • • · · · · · · · · · · · · · · · · ·	1.57 (0.76-3.25)	
Positive	142	H H		0.22 (0.07-0.72)		⊢●∔ ⊣	0.44 (0.16-1.26)		H 	0.19 (0.06-0.64)		⊢ ●	0.68 (0.19-2.41)	
PR expression					0.06			0.04			0.06			0.18
Negative	238		4	0.49 (0.23-1.07)		· · · · · · · · · · · · · · · · · · ·	1.24 (0.59-2.58)		⊢ ● -∔-1	0.60 (0.28-1.25)		⊢ ● ∔───	0.79 (0.37-1.68)	
Positive	290		∔ ⊣	0.57 (0.23-1.43)		⊢ ∔−−−−i	1.03 (0.47-2.27)		H 	0.39 (0.16-0.93)		•	1.85 (0.78-4.40)	
ER expression					0.19			0.17			0.10			0.61
Negative	117	•		0.18 (0.05-0.66)		⊢ • ¦	0.85 (0.26-2.81)		⊢●‡	0.32 (0.09-1.17)		H•	0.23 (0.05-1.03)	
Positive	411		∔ -1	0.67 (0.34-1.29)		⊢∔∙	1.25 (0.69-2.29)		⊢● •	0.56 (0.30-1.06)		⊢ ∔ _●	1.40 (0.76-2.57)	
WT-1 expression					0.06			0.00			0.01			0.19
Negative	168	••••		0.22 (0.08-0.62)			0.82 (0.35-1.91)		H •	0.25 (0.08-0.76)		⊢●───┤	0.31 (0.11-0.88)	
Positive	342		↓	0.98 (0.45-2.12)		, , , , , , , , , , , , , , , , , , , 	1.04 (0.49-2.20)		⊢● ∔	0.72 (0.34-1.52)		⊢ ∎	1.69 (0.85-3.37)	
P53 expression					0.86			0.90			0.71			0.70
Negative	139		<u> </u>	0.77 (0.26-2.25)		•	1.88 (0.61-5.77)		H•	0.33 (0.10-1.09)		•	2.31 (0.72-7.47)	
Positive	423	H I	:	0.39 (0.20-0.76)		⊢ ∎	0.97 (0.55-1.70)		⊢ ● —_ i	0.46 (0.25-0.87)			1.04 (0.59-1.85)	
		0.5	1 1.5 2 2.5 3 3.5 4	highest vs lowes	t	0 0.5 1 1.5 2 2.5 3 3.5	highest vs lowest		0 0.5 1 1.5 2 2.5 3 3	3.5 4 highest vs lowest		0 0.5 1 1.5 2 2.5 3 3.5 4	highest vs lowe	st

Supplementary Figure 2 Subgroup analyses for the association between dietary fat-soluble choline, water-soluble choline, total choline, betaine intake and total mortality of ovarian cancer for the highest vs. lowest category (n = 635).

Dietary fat-soluble choline, water-soluble choline, total choline, and betaine intake was adjusted for energy by the residual method. Data were presented as adjusted hazard ratio (HR) and 95% confidence intervals (CIs). The association were analyzed for each subgroup with the use of fully

adjusted Cox proportional hazards regression model. Cross-product terms were used to evaluate multiplicative interactions.

ER.	Estrogen	Receptor:	PR,	Progesterone	Receptor:	WT-1,	Wilms'	tumour-1.
		,	,		,	·· = =,		

Characteristics	Cases	Phosphatidylcholine intake	HR (95% CI)	P for interaction	Sphingomyelin intake	HR (95% CI)	P for interaction
Age at diagnosis (years)				0.37			0.40
≤50	232	⊢●	0.77 (0.30-1.96)			0.95 (0.38-2.39)	
>50	403	- -	0.47 (0.25-0.88)		⊢ ● ∔ ⊣	0.65 (0.36-1.18)	
Body mass index (kg/m ²)				0.95			0.95
<25	164	⊢● _∔	0.60 (0.34-1.06)		⊢ ● ┇──1	0.81 (0.46-1.42)	
≥25	471 ⊢	• •	0.44 (0.13-1.57)		⊢ ⊸ ∮	0.84 (0.28-2.47)	
Menopausal status				0.73			0.68
Premenopausal	178 ⊢	• •	0.36 (0.11-1.16)		⊢ ● ┇────┤	0.74 (0.24-2.27)	
Postmenopausal	457	⊢ ●	0.57 (0.31-1.02)		⊢ ● -∔-i	0.68 (0.38-1.20)	
Alcohol drinking				0.16			0.21
No	126		0.46 (0.26-0.81)		⊢ ●ŧ	0.63 (0.37-1.07)	
Yes	509	⊢	1.06 (0.29-3.86)		+ •	- 1.58 (0.40-6.29)	
Histological type				0.30			0.50
Serous	430	→	0.70 (0.37-1.31)			0.73 (0.40-1.34)	
Non-serous	205 ⊦●	∟ ⊣ I	0.26 (0.10-0.70)		⊢ _ ●	0.79 (0.31-2.02)	
FIGO stage				0.48			0.68
I-II	306 ⊢	▶ !	0.28 (0.10-0.79)		⊢ ●	0.52 (0.20-1.33)	
III-IV	307	⊢ ●	0.68 (0.37-1.25)		⊢ ● ↓ (0.82 (0.45-1.48)	
Residual lesions				0.23			0.24
No	280 ⊢	•	0.35 (0.18-0.65)		⊢ ● _∔	0.61 (0.33-1.12)	
Yes	355	· · · · ·	1.24 (0.49-3.11)		· · · · ·	1.16 (0.48-2.81)	
Vimentin expression				0.41			0.51
Negative	319	•	0.49 (0.24-1.02)			0.67 (0.33-1.38)	
Positive	142 ዞ	I	0.22 (0.07-0.72)			0.63 (0.20-2.01)	
PR expression				0.07	1		0.02
Negative	238 +	• •	0.49 (0.23-1.07)			0.70 (0.33-1.50)	
Positive	290 H	_ _	0.55 (0.23-1.36)		⊢ _	0.87 (0.39-1.94)	
ER expression				0.20			0.05
Negative	117 🔸		0.18 (0.05-0.66)		· • • • •	0.42 (0.10-1.79)	
Positive	411		0.66 (0.34-1.27)		⊢ ● ↓	0.85 (0.47-1.55)	
WT-1 expression				0.06			0.01
Negative	168 ⊦●	I	0.23 (0.08-0.65)		, _●_ ,	0.60 (0.25-1.45)	
Positive	342		0.96 (0.44-2.10)		· • • · · · · · · · · · · · · · · · · ·	1.00 (0.47-2.16)	
P53 expression				0.87			0.99
Negative	139	_ ;	0.70 (0.24-2.07)		• • • •	0.78 (0.26-2.36)	
Positive	423 ⊦	• ł	0.39 (0.20-0.76)		,_ ●.↓ _,	0.73 (0.40-1.33)	
	0	0.5 1 1.5 2 2.5 3 3.5 4	highest vs lowes	t	0 0.5 1 1.5 2 2.5 3 3.5	4 highest vs lowest	

Supplementary Figure 3 Subgroup analyses for the association between dietary phosphatidylcholine, and sphingomyelin intake and total mortality of ovarian cancer for the highest vs. lowest category (n = 635).

Dietary phosphatidylcholine, sphingomyelin intake was adjusted for energy by the residual method. Data were presented as adjusted hazard ratio (HR) and 95% confidence intervals (CIs). The associations were analyzed for each subgroup with the use of fully adjusted Cox proportional hazards regression model. Cross-product terms were used to evaluate multiplicative interactions.

ER, Estrogen Receptor; PR, Progesterone Receptor; WT-1, Wilms' tumour-1.

Characteristics	Cases	Fat-soluble choline intake	HR (95% CI)	P for	Glycerophosphocholine intake	HR (95% CI)	P for	Phosphocholine intake	HR (95% CI)	P for
Age at diagnosis (vears)				0.81			0.12			0.73
	232	⊢ ∎ ●	1.37 (0.58-3.24)		⊢ ,●	1.26 (0.54-2.93)		⊢ ∙ – – – – – – – – – – – – – – – – – – –	1.46 (0.64-3.33)	
>50	403	⊢ ● ∔ _(0.74 (0.43-1.29)		—	1.19 (0.68-2.10)		, ● ; _ _,	0.80 (0.46-1.38)	
Body mass index (kg/m ²)				0.72			0.23	1		0.95
<25	164	⊢ ● ∔_ (0.77 (0.45-1.29)			1.28 (0.73-2.25)		⊢ ● ! '	0.88 (0.52-1.47)	
>25	471	· · · · · · · · · · · · · · · · · · ·	1.45 (0.53-3.96)		⊢	1.03 (0.40-2.67)		⊢ 	0.95 (0.37-2.44)	
Menopausal status				0.41			0.03			0.93
Premenopausal	178	·•	0.94 (0.37-2.41)			0.53 (0.18-1.53)		⊢ ∔∙−−−−−	1.25 (0.49-3.16)	
Postmenopausal	457	⊢ ● ! →	0.83 (0.48-1.41)		⊢	1.49 (0.87-2.56)		⊢ ∙	0.88 (0.52-1.48)	
Alcohol drinking				0.62			0.92			0.29
No	126	⊢_i •i	1.13 (0.67-1.91)		, ∔ •,	1.38 (0.80-2.37)		⊢ ∳	1.04 (0.63-1.73)	
Yes	509 H	⊢ ⊣ i	0.18 (0.05-0.60)		· · · · · · · · · · · · · · · · · · ·	1.35 (0.47-3.88)		⊢ ●	0.51 (0.18-1.47)	
Histological type				0.80			0.00	1		0.36
Serous	430	⊢ 	0.96 (0.55-1.68)		⊢	0.96 (0.54-1.70)		⊢●╂─┤	0.77 (0.45-1.31)	
Non-serous	205	⊢ 	0.97 (0.42-2.27)		· i	2.08 (0.85-5.12)		· •	1.52 (0.61-3.80)	
FIGO stage				0.28			0.23			0.97
I-II	306 ⊦	•	0.34 (0.15-0.75)		⊢∔ ●−−−−−−−−	1.36 (0.57-3.24)		⊢ ● ¦ → ·	0.72 (0.31-1.70)	
III-IV	307	↓ !	1.69 (0.91-3.12)		, i● ,	1.10 (0.62-1.93)		⊢ .	0.98 (0.58-1.67)	
Residual lesions				0.06			0.05			0.20
No	280	⊢●_∔-	0.71 (0.41-1.22)		· + • · · · · · ·	1.37 (0.76-2.45)		⊢ ● ∔──1	0.84 (0.48-1.48)	
Yes	355	⊢ ∔●	1.89 (0.77-4.60)		· · · · · · · · · · · · · · · · · · ·	1.17 (0.52-2.62)		⊢ 	1.15 (0.54-2.46)	
Vimentin expression				0.61			0.53			0.78
Negative	319	⊢! ● −−−−−−	1.32 (0.64-2.74)		⊢ ∎−−−−−−−−−−−−−−−−−−−−−−−−−−−−−−−−−−−−	1.47 (0.71-3.03)		⊢	1.15 (0.59-2.25)	
Positive	142 H	⊢ I	0.18 (0.06-0.53)		⊢ 	0.77 (0.24-2.45)		H•	0.27 (0.08-0.88)	
PR expression				0.07			0.03			0.02
Negative	238	⊢● ŧ	0.52 (0.25-1.08)		•	2.42 (1.14-5.15)		⊢ ∎	1.14 (0.56-2.34)	
Positive	290	↓ ● ↓	1.12 (0.52-2.43)		⊢ ● ¦ ───'	0.79 (0.35-1.75)		⊢ ∙ ∔───	0.85 (0.40-1.80)	
ER expression				0.28			0.24	1		0.12
Negative	117 H		0.18 (0.05-0.68)		•	2.43 (0.77-7.71)		·● ¦ '	0.63 (0.19-2.03)	
Positive	411	⊢ 	1.07 (0.58-1.96)		⊢ ∎■	1.27 (0.69-2.35)		·	1.09 (0.60-1.95)	
WT-1 expression				0.00			0.00			0.00
Negative	168 ⊢	•	0.31 (0.13-0.77)		· 	1.86 (0.78-4.41)		⊢● _ <u></u>	0.53 (0.21-1.30)	
Positive	342	⊢ ∔ ∙●────┤	1.35 (0.62-2.91)			0.88 (0.43-1.80)		⊢ •	0.97 (0.50-1.88)	
P53 expression				0.96			0.34			0.67
Negative	139	· · · · · · · · · · · · · · · · · · ·	1.13 (0.39-3.27)		· · · · · · · · · · · · · · · · · · ·	1.66 (0.45-6.09)		⊢ ↓ ●	— 1.65 (0.56-4.88)	
Positive	423	→● ¹	0.84 (0.48-1.45)			1.17 (0.67-2.05)			0.77 (0.45-1.32)	
	0	0.5 1 1.5 2 2.5 3 3.5 4	highest vs lowes	t	0 0.5 1 1.5 2 2.5 3 3.5 4	highest vs lowest		0 0.5 1 1.5 2 2.5 3 3.5	4 highest vs lowest	

Supplementary Figure 4 Subgroup analyses for the association between dietary free choline, glycerophosphocholine, and phosphocholine intake and total mortality of ovarian cancer for the highest vs. lowest category (n = 635).

Dietary free choline, glycerophosphocholine, phosphocholine intake was adjusted for energy by the residual method. Data were presented as adjusted hazard ratio (HR) and 95% confidence intervals (CIs). The associations were analyzed for each subgroup with the use of fully adjusted Cox proportional hazards regression model. Cross-product terms were used to evaluate multiplicative interactions. ER, Estrogen Receptor; PR, Progesterone Receptor; WT-1, Wilms' tumour-1.