



# RED MEAT AND PROCESSED MEAT

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**Table 2.4.4 Case-control studies: Processed meat and cancer of the pancreas (web only)**

Reference, location enrolment/follow-up period, study design	Population size, description, exposure assessment method	Organ site	Exposure category or level	Exposed cases/deaths	Risk estimate (95% CI)	Covariates controlled
Mizuno et al. (1992) Japan 1989–1990	<b>Cases:</b> 124; From 7 hospitals <b>Controls:</b> 124; Sex-age-matched patients with benign disease <b>Exposure assessment method:</b> Questionnaire; Questionnaire covering preceding diseases, smoking, alcohol, and diet; validation not mentioned.	Pancreas: pancreas	Ham/sausage (frequency)			Age and sex
			≥ 3 times/week	23	1.05 (0.54–2.04)	
Lyon et al. (1993) Utah, USA 1984–1987	<b>Cases:</b> 149; Utah Cancer Registry <b>Controls:</b> 363; Random digit-dialing and Health Care Financing records <b>Exposure assessment method:</b> Questionnaire; 32 item FFQ. Red meat included beef & pork	Pancreas	Nitrated meats			Age, smoking, coffee, alcohol
			<b>Men:</b> Low	15	1	
			Medium	17	1.28 (0.56–2.91)	
		Pancreas	High	55	2.77 (1.34–5.72)	Same as above
			Trend-test p-value: 0.0002			
			Nitrated meats			
<b>Women:</b> Low	16	1				
Medium	19	0.85 (0.39–1.88)				
High	24	1.08 (0.48–2.42)				
Trend-test p-value: 0.15						
Ohba et al. (1996) Japan 1987–1992	<b>Cases:</b> 141; From Sapporo Medical University & affiliated hospitals <b>Controls:</b> 282; From telephone books; matched for sex, age, and residence <b>Exposure assessment method:</b> Questionnaire; FFQ administered to cases in person and mailed to controls, supported by telephone interview.	Pancreas	Ham/sausage (frequency)			None
			> 3 times/wk	NR	0.89 (0.44–1.77)	

**Table 2.4.4 Case-control studies: Processed meat and cancer of the pancreas (web only)**

Reference, location enrolment/follow-up period, study design	Population size, description, exposure assessment method	Organ site	Exposure category or level	Exposed cases/deaths	Risk estimate (95% CI)	Covariates controlled
Soler et al. (1998) Italy 1983–1992	<b>Cases:</b> 362; Hospital patients with incident cancer <b>Controls:</b> 1552; Hospital-based controls for acute, non-neoplastic diseases. <b>Exposure assessment method:</b> Questionnaire; Interview with a structured questionnaire. Validity not reported.	Pancreas	Ham and sausages (frequency of consumption)			Age, sex, education, tobacco consumption, and area of residence
			Low	122	1	
			Intermediate	100	1.24 (0.92–1.68)	
			High	140	1.64 (1.24–2.18)	
Chan et al. (2007) USA 1995–1999	<b>Cases:</b> 532; Northern California Cancer Center, age 21–85 years <b>Controls:</b> 1701; General population by random digit dialling, matched by age & sex <b>Exposure assessment method:</b> Questionnaire; Validated 131-item food-frequency questionnaire.	Pancreas	Sausage, kielbasa, etc. (2 oz. [~579] frequency)			Age, sex, total energy intake, BMI, race, education, smoking, diabetes
			< 1/month	258	1	
			1–3/month	141	1.2 (1–1.6)	
			1/week	48	1 (0.7–1.5)	
			≥ 2/week	79	1.8 (1.3–2.6)	
			Trend-test p-value: 0.003			
		Pancreas	Salami, bologna, other processed meat sandwiches (1 whole; frequency)			Same as above
			< 1/month	145	1	
			1–3/month	70	1.6 (1.2–2.3)	
			1/week	49	2.3 (1.5–3.5)	
≥ 2/week	49		1.9 (1.3–3)			
	Trend-test p-value: 0.2					

**Table 2.4.4 Case-control studies: Processed meat and cancer of the pancreas (web only)**

Reference, location enrolment/follow-up period, study design	Population size, description, exposure assessment method	Organ site	Exposure category or level	Exposed cases/deaths	Risk estimate (95% CI)	Covariates controlled
Hu et al. (2008) Canada 1994–1997	<b>Cases:</b> 628; Age 20–76 yr from provincial cancer registries <b>Controls:</b> 5039; Random sample within provinces, frequency matched by age & sex <b>Exposure assessment method:</b> Questionnaire; Block FFQ short version (69 items)	Pancreas	Bacon (2 slices; frequency)			Same as above
			< 1/month	228	1	
			1–3/month	111	0.9 (0.7–1.2)	
			1/week	92	1.1 (0.8–1.4)	
			2–4/week	74	1.3 (0.9–1.9)	
			≥ 4/week	21	1.9 (1–3.5)	
				Trend-test p-value: 0.04		
		Pancreas	Beef or pork hotdogs (1 whole; frequency)			Same as above
			< 1/month	302	1	
			1–3/month	137	1 (0.7–1.2)	
			≥ 1/week	87	1.1 (0.8–1.4)	
				Trend-test p-value: 0.9		
		Pancreas	Chicken or turkey hotdogs (1 whole; frequency)			Same as above
			< 1/month	261	1	
			≥ 1/month	52	0.6 (0.4–0.9)	
				Trend-test p-value: 0.008		
Pancreas	Processed meat (servings/week)			Age, province, education. BMI, sex, alcohol use, smoking, total of vegetable and fruit intake, and total energy intake		
	Q1	NR	1			
	Q2	NR	1.1 (0.8–1.4)			
	Q3	NR	1.3 (1–1.8)			
	Q4	NR	1.4 (1–1.9)			
		Trend-test p-value: 0.01				

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