

Farming exposures and Alzheimer's disease: cross-sectional analysis within the French AGRICAN cohort¹

by *Victoire Madeline, MD, Angéline Galvin, PhD, Lucie De Graaf, PhD, Julien Engelhardt, PhD, Pierre Lebailly PhD, Isabelle Baldi, PhD*

1. Supplementary material

2. Correspondence to: Isabelle Baldi, Equipe EPICENE, INSERM U 1219, Bordeaux Population Health Centre, 146 rue Léo Saignat, 33076 Bordeaux, France. [E-mail: Isabelle.Baldi@u-bordeaux.fr]

S1: Risks of Alzheimer's according to sex for various exposure metrics

	Men			Women		
	<i>nE</i>	<i>OR</i>	<i>95% CI</i>	<i>nE</i>	<i>OR</i>	<i>95% CI</i>
Pesticide Use	120	1.14	0.85-1.53	75	1.42	1.10-1.85
Work in agriculture	237	1.81	0.92-3.57	495	1.58	0.94-2.86
Livestock						
Cattle	186	1.77	0.88-3.53	410	1.60	0.94-2.73
Sheep/goats	41	1.47	0.75-2.90	93	1.83	1.01-3.29
Pigs	91	1.44	0.79-2.64	256	1.98	1.14-3.46
Horses	95	1.30	0.71-2.38	130	1.84	1.03-3.29
Poultry	88	1.29	0.70-2.37	340	1.80	1.05-3.07
Open field crops						
Wheat/barley	138	1.16	0.65-2.06	222	1.97	1.13-3.44
Corn	85	1.26	0.69-2.29	104	2.08	1.15-3.76
Rapeseed	41	1.87	0.98-3.55	27	1.97	0.97-4.02
Sunflower	18	1.82	0.83-3.98	15	2.55	1.16-5.61
Field peas	12	1.34	0.57-3.16	24	1.97	0.98-3.96
Beets	70	1.42	0.76-2.65	135	1.71	0.95-3.03
Meadows	188	1.37	0.78-2.42	307	1.75	1.02-3.00
Potatoes	103	1.41	0.77-2.56	209	1.66	0.95-2.91
Other crops						
Vineyards	107	1.48	0.82-2.66	211	1.81	1.06-3.12
Fruit-growing	60	1.30	0.69-2.44	139	1.85	1.05-3.25
Tobacco	26	1.48	0.71-3.10	55	1.52	0.82-2.80
Vegetables	28	1.41	0.71-2.83	76	1.99	1.09-3.62
Greenhouses	7	1.65	0.61-4.45	15	2.08	0.97-4.46

nE: number of cases exposed; All models adjusted for Age, Education Level, Tobacco Smoking, Alcohol Consumption, BMI. Reference group consisted of non-agricultural participants.

S2: Risks of Alzheimer's disease according to sex and quantitative metrics for livestock (duration, maximal number of animals) and crops (duration and surface)

	Men			Men			Women			Women		
	Duration of crop growing (per 10 yr) or duration of animal raising (per 10 yr)			# of animals (per ten) or crop surfaces (per 10 ha)			Duration of crop growing (per 10 yr) or duration of animal raising (per 10 yr)			# of animals (per ten) or crop surfaces (per 10 ha)		
	nE	OR	95% CI	nE	OR	95% CI	nE	OR	95% CI	nE	OR	95% CI
LIVESTOCK*												
Cattle	107	1.02	0.90-1.15	114	1.00	0.99-1.01	252	1.01	0.93-1.11	243	1.00	0.99-1.01
Sheep/Goats	23	1.27	0.98-1.64	24	1.00	0.99-1.01	38	1.12	0.91-1.38	47	0.90	0.80-1.00
Pigs	51	1.24	1.02-1.50	51	1.00	0.99-1.01	122	1.02	0.89-1.16	130	0.70	0.21-2.41
Horses	49	1.23	0.99-1.51	51	0.99	0.85-1.17	51	0.81	0.64-1.03	60	1.00	0.99-1.01
Poultry	34	1.11	0.92-1.35	36	1.00	0.99-1.00	157	0.97	0.88-1.07	138	1.00	0.99-1.00
OPEN FIELD CROPS												
Wheat/barley	138	1.13	0.96-1.33	44	0.98	0.89-1.08	197	1.03	0.89-1.19	57	1.05	0.96-1.14
Corn	80	1.02	0.81-1.27	27	0.96	0.82-1.13	94	0.83	0.65-1.05	22	1.05	0.77-1.44
Sunflower	18	1.13	0.63-2.03	5	0.93	0.45-1.94	15	1.43	0.80-2.56	6	1.31	0.51-3.42
Rapeseed	36	0.92	0.61-1.40	8	0.94	0.57-1.55	27	1.32	0.88-1.99	10	1.23	0.60-2.51
Field peas	12	0.70	0.19-2.58	0	*	*	19	0.75	0.32-1.73	0	*	*
Beets	70	0.97	0.76-1.23	19	0.99	0.82-1.18	120	0.98	0.80-1.21	37	0.44	0.12-1.72
Meadows	168	1.07	0.94-1.22	70	1.00	0.99-1.06	292	0.94	0.84-1.05	128	1.02	0.99-1.06
Potatoes	47	1.00	0.85-1.18	39	1.00	0.94-1.07	100	1.06	0.93-1.20	84	1.00	0.97-1.04
OTHER CROPS												
Vineyards	102	1.04	0.88-1.24	30	0.98	0.85-1.13	196	0.98	0.86-1.12	52	1.01	0.99-1.04
Fruit-Growing	60	0.93	0.75-1.15	9	0.98	0.70-1.37	129	0.90	0.77-1.06	40	0.87	0.58-1.34
Vegetables	23	1.22	0.88-1.70	10	0.25	0.02-2.96	56	0.95	0.75-1.21	31	1.00	0.93-1.06
Tobacco	26	1.33	0.90-1.95	9	0.79	0.36-1.74	50	0.91	0.68-1.22	23	1.06	0.91-1.24
Greenhouses	7	0.93	0.43-2.02	4	0.98	0.95-1.01	15	0.85	0.48-1.50	8	1.00	0.99-1.01

ORs are calculated for the increment of 10 year for duration and for the increment of 10 animals/10 hectares, nE: number of cases exposed; *: numbers too limited (ne<3); All models adjusted for Age, Education Level, Tobacco Smoking, Alcohol Consumption, BMI. In the main analysis, the reference group consisted of non-agricultural participants.

S3: Models with and without imputation of missing data for covariates (education, smoking, BMI, alcohol) adjusted on age -Illustrations

	Models with no imputation on covariates		Models with multiple imputation on the covariates		% change in OR
	OR	95% CI	OR	95% CI	
Men					
Pesticide use vs no use	1.14	0.85-1.53	1.14	0.91-1.43	0%
Work on a farm	1.81	0.92-3.57	1.59	0.98-2.58	-12%
Pesticide use on vines	2.03	0.98-4.24	1.94	1.15-3.28	-4%
Women					
Pesticide use vs no use	1.43	1.10-1.85	1.33	1.07-1.66	-7%
Work on a farm	1.58	0.94-2.66	1.16	0.79-1.71	-27%
Pesticide use on vines	2.02	0.98-4.16	1.56	0.90-2.69	-23%

Reference group: non-agricultural participants