

Supplementary data

Farming in childhood, diet in adulthood and asthma history

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MATERIALS AND METHODS

Ecological scores to assess potential contact with livestock, were built in several steps.

First, appropriate areas and reference periods were chosen in an interdisciplinary research frame with geographers. France is divided geographically according into: 22 regions, 96 Departments, 3,644 cantons, and 36,600 communes. We conducted in depth analyses of farming activities in two contrasted regions (Aquitaine, a vineyard region with Bordeaux wine, and Normandy, a bovine region with Camembert production) using the General Agricultural Census (GAC), at two time points, 1955 (close to the year of birth of the women) and 1970 (the first computerized census). These analyses showed that the 1970 census was adequate to estimate the bovine density score in 1955 (high correlation) and that appropriate to group communes with fewer than 1,000 inhabitants with other small communes from the same canton.

We defined six livestock density scores based on the 1970 GAC for all French communes, combining the number of livestock per inhabitant (cattle, pigs, poultry, goats, sheep, horses) and the size of the commune. Each score ranged from 0 (not rural) to 3 (highly exposed to livestock); the categories differed for the six scores, and were defined to contrast exposure while having enough women in each category. The bovine density score was based on categories of <1 cattle/inhabitant in the commune (or canton), 1 and ≥ 2 . Similar scores were constructed for pigs, poultry, goats (the 'caprine score'), sheep (the 'ovine score') and horses with different categories for the number of livestock per inhabitant: <0.5, 0.5-0.9, ≥ 1 for pigs; <5, 5-9, ≥ 10 for poultry; <0.2, 0.2-0.4, ≥ 0.5 for sheep and goats; <0.05, 0.05-0.09, ≥ 0.1 for horses. The geographical distribution of these scores showed the expected agricultural heterogeneity for France (figure 1).

The coherence of the bovine density score was also confirmed as the percentage of women who reported living on a farm during childhood increased markedly with the bovine density score (P for trend < 0.0001, figure 2).

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The flow chart of the women included in the analysis is presented in figure 3. The comparison of women included (n=54,018) and excluded (n=19,542) is presented in table 1.

Figure 1 Distribution of livestock (bovine, caprine, ovine) scores in France.
0: not rural, 1: low density score, 2: medium density score, 3: high density score

Figure 2 Validity of the bovine density score – women who have lived on a farm according to the level of the bovine density score

Figure 3 Flow chart

Figure 1

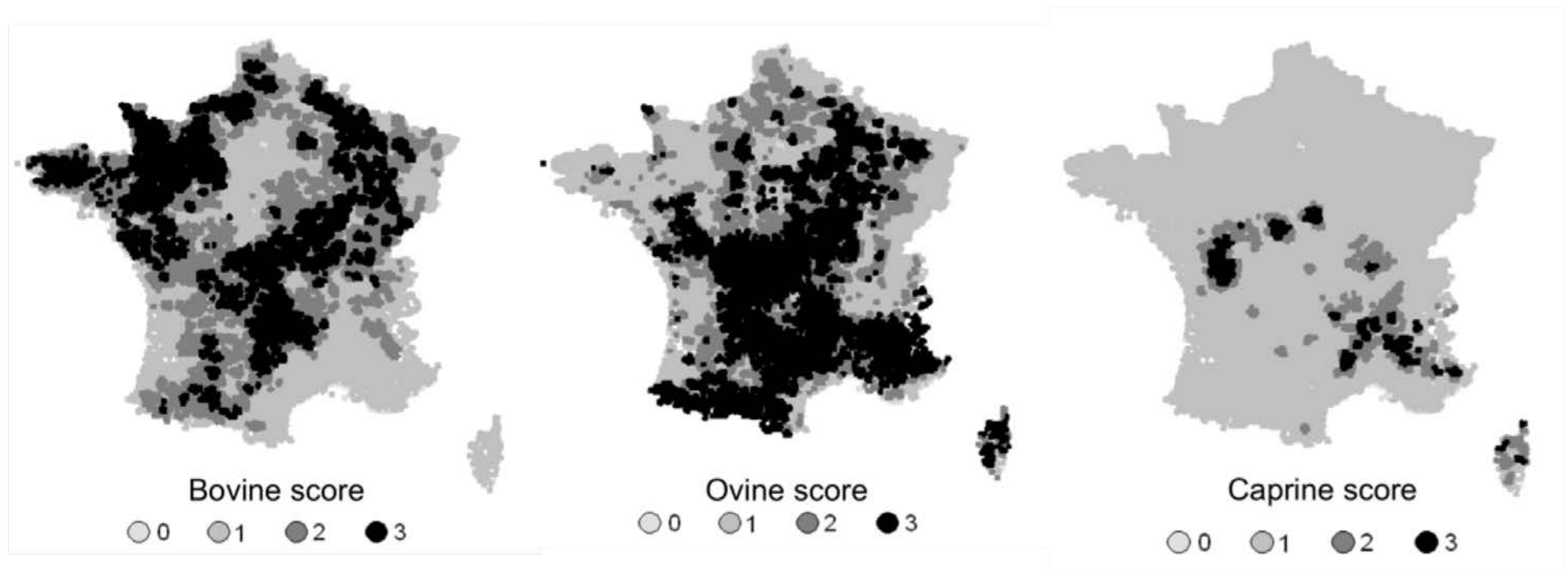
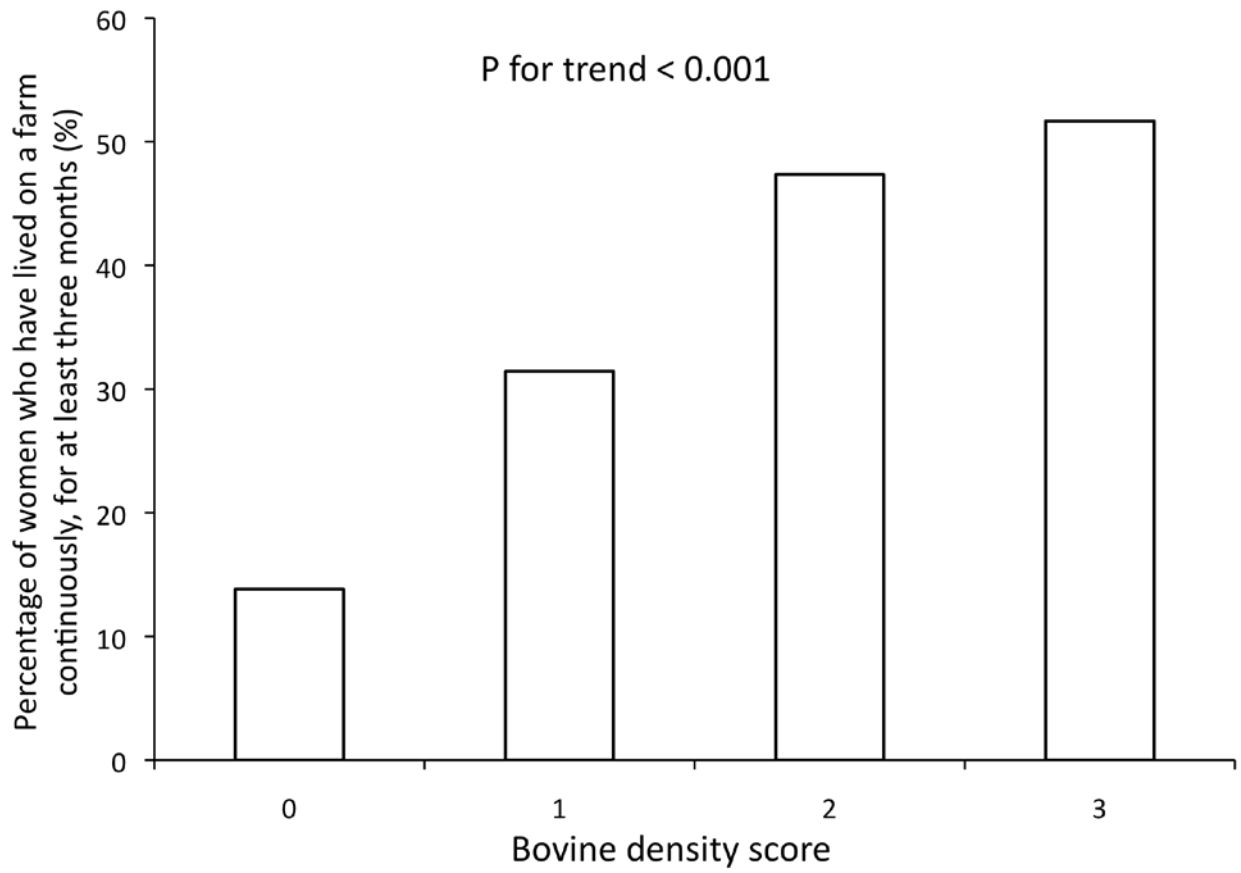


Figure 2



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Figure 3



^a At least 3 months continuously (from the questionnaire)

^b Rural place: <5,000 inhabitants (from ecological data)

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Table 1 Comparison of women included and excluded from the analysis, E3N study, France (n=74,525)

	Women included (n=54,018)	Women excluded (n=20,507)	<i>P value</i>
Missing data for asthma, n (%) ^a	0 (0.0)	17,646 (86.0)	/
Missing data for farmer parents, n (%) ^a	0 (0.0)	1,896 (9.3)	/
Missing data for improbable diet, n (%) ^b	0 (0.0)	965 (4.7)	/
Age, years (mean (SD)) ^b	52.6 (6.5)	53.8 (7.1)	<0.001
Childhood asthma, (%)	2.1	2.3	0.20
Adult onset asthma, (%)	4.3	4.8	0.15
Farmer parents, (%)	12.1	12.2	0.70
Born in a rural area (<5,000 inhabitants), (%)	35.7	35.1	0.22
Bovine density score, place of birth, (%)			
0	64.4	65.0	
1	22.3	22.6	0.10
2	8.0	7.5	
3	5.3	4.9	
Pets in childhood, % ^a			
No pets	40.0	44.5	
Cats only	16.8	14.1	
Dogs only	13.1	12.0	<0.001
Cats and dogs	25.7	23.2	
Missing	4.4	6.2	
Tobacco consumption, % ^b			
Never smokers	56.2	56.5	

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Past smokers	30.6	28.3	<0.001
Current smokers	13.2	15.2	
Menopausal status, % ^a			
Premenopause	10.6	4.7	
Postmenopause	89.3	95.2	<0.001
Perimenopause	0.1	0.1	
Education, number of years of school			
(%)			
≤ 11	10.5	15.6	
12-14	51.8	48.9	<0.001
15-16	19.1	18.0	
≥ 17	18.6	17.5	
Physical activity, metabolic equivalent / week (mean (SD)) ^b	40.0 (27.6)	39.7 (28.4)	0.13
Body mass index, kg/m ² , (mean (SD)) ^{b,c}	22.9 (3.2)	23.1 (3.5)	<0.001
Body mass index, kg/m ² (%) ^{b,c}			
< 20	13.2	11.5	
20-24.9	56.4	46.5	
25-29.9	14.2	14.1	<0.001
≥ 30	2.8	3.4	
Missing	13.4	24.5	
Total energy intake, kilocalories/day (mean (SD)) ^b	2178 (570)	2171 (810)	0.27
Supplement use, % ^{a,d}	37.5	24.2	<0.001

Abbreviations: SD, standard deviation

^a Recorded in 2003.

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^b Recorded in 1993.

^c Body mass index: weight (in kilograms)/height² (in meters).

^d Includes calcium, fluorine, iron, magnesium, phytoestrogens (soy), other minerals/trace-elements, vitamin A, vitamin B, vitamin C, vitamin D, vitamin E, folic acid, beta carotene, other vitamins.