

Supplementary material

File S1. Questionnaire carried out on participating farms (in a separate document)

Table S1. Data Envelopment Analysis (DEA) matrix for the complete set of farms and eco-efficiency score

DMU ^a	Output (desirable) Production value (EUR/year)	Output (undesirable) Climate change (CC. kg CO ² -eq/kg live weight)	Input 1. Surface in <i>montanera</i> (ha)	Input 2. Number of sows	Eco- efficiency score
1	269,568.10	3.900	600	80	0.939
2	84,268.50	2.975	230	20	1.000
3	86,872.50	3.607	700	33	0.839
4	108,018.00	3.121	550	19	0.967
5	51,287.42	6.073	0	15	1.000
6	30,577.77	3.480	200	12	0.899
7	56,029.05	4.300	200	12	0.706
8	62,689.00	5.164	300	19	0.480
9	229,056.00	3.842	1500	90	0.859
10	137,433.60	3.559	400	40	0.880
11	63,455.85	5.524	0	22	1.000
12	148,886.40	3.450	235	50	0.929
13	99,916.65	3.482	200	0	1.000
14	64,810.80	3.527	500	12	0.874
15	86,414.40	3.114	398	10	0.987
16	335,702.61	4.247	750	83	1.000
17	109,971.00	3.440	600	30	0.889
18	634,500.09	4.393	2000	100	1.000
19	98,650.04	4.155	380	22	0.722
20	70,018.80	3.619	1000	30	0.828
21	91,458.30	3.440	600	30	0.880
22	162,027.00	3.430	1492	42	0.917
23	152,970.84	3.232	80	22	1.000
24	85,896.00	3.321	550	25	0.904
25	118,819.80	3.290	480	0	1.000
26	13,502.25	3.450	18	0	1.000
27	243,040.50	3.244	600	30	1.000
28	135,022.50	3.524	340	0	1.000
29	162,027.00	3.681	400	0	1.000
30	74,051.40	2.878	300	18	1.000
31	89,935.83	3.673	360	30	0.825
32	183,630.60	3.581	960	0	1.000
33	49,667.20	3.353	130	20	0.949
34	102,327.75	3.156	270	40	0.960
35	34,358.40	3.426	130	10	0.942

^aDMU: Decision making unit.

Table S2. Input/output target and operational reduction percentages for inefficient farms

DMU ^a	Input 1. Surface in <i>montanera</i>	Input 2. Number of sows	% of reduction Surface in <i>montanera</i>	% of reduction Number of sows	Output (desirable) Production value (EUR/year)	Output (undesirable) Climate change (CC. kg CO2- eq)	% of reduction Climate change (CC. kg CO2- eq)	% of increase Production value (EUR/year)
1	600	51.37	-28.63	0	286,974.19	3.70	-5.25	6.46
3	352.34	20.09	-12.91	-49.67	103,534.53	2.94	-18.44	19.18
4	374.87	19	0	-31.84	111,744.25	2.98	-4.37	3.45
6	200	12	0	0	54,074.96	3.08	-11.55	76.84
7	200	12	0	0	79,409.93	3.14	-26.91	41.73
8	300	19	0	0	130,647.22	3.09	-40.07	108.41
9	684.12	34.21	-55.79	-54.39	266,562.82	3.31	-13.77	16.37
10	400	23.63	-16.37	0	156,184.07	3.08	-13.48	13.64
12	235	23.15	-26.85	0	160,187.49	3.18	-7.97	7.59
14	360	12	0	-28	88,974.20	3.02	-14.51	37.28
15	380	10	0	-4.52	93,948.47	3.06	-1.69	8.72
17	388.18	21.53	-8.47	-35.30	123,722.20	2.99	-13.21	12.50
19	380	22	0	0	136,547.16	3.03	-26.98	38.42
20	318.71	18.75	-11.25	-68.13	84,589.71	2.90	-19.86	20.81
21	353.11	20.12	-9.88	-41.15	103,967.06	2.94	-14.45	13.68
22	482.22	25.29	-16.71	-67.68	176,696.34	3.10	-9.62	9.05
24	337.20	19.49	-5.51	-38.69	95,006.66	2.92	-11.98	10.61
31	360	20.47	-9.53	0	108,957.85	2.95	-19.58	21.15
33	130	20	0	0	120,264.83	3.15	-5.97	142.14
34	270	19.92	-20.08	0	106,597.38	2.99	-5.18	4.17
35	130	10	0	0	48,678.76	3.20	-6.52	41.68

^aDMU: Decision making unit.

Table S3. Benchmarks intensities of inefficient farms

Benchmark intensities									
Inefficient DMU ^a	λ_2	λ_{13}	λ_{16}	λ_{18}	λ_{23}	λ_{25}	λ_{26}	λ_{27}	λ_{30}
1	0	0	0.2442	0.1856	0.5702	0	0	0	0
3	0	0	0	0	0	0	0	0.1745	0.8255
4	0	0	0	0	0	0.0792	0	0.2021	0.7188
6	0.0592	0	0	0	0	0	0.3399	0	0.6009
7	0	0.1879	0	0	0.1422	0	0.1771	0	0.4929
8	0	0	0	0	0.3122	0.1189	0	0.1576	0.4113
9	0	0	0	0.0601	0	0	0	0.9399	0
10	0	0	0	0	0.1272	0	0	0.4266	0.4462
12	0	0	0	0	0.6051	0	0	0.2271	0.1677
14	0	0	0	0	0	0.3333	0	0	0.6667
15	0	0	0	0	0	0.4444	0	0	0.5556
17	0	0	0	0	0	0	0	0.2939	0.7061
19	0	0	0	0	0.0898	0.0139	0	0.3242	0.5721
20	0	0	0	0	0	0	0	0.0624	0.9376
21	0	0	0	0	0	0	0	0.177	0.823
22	0	0	0	0	0	0	0	0.6074	0.3926
24	0	0	0	0	0	0	0	0.124	0.876
31	0	0	0	0	0.0055	0	0	0.204	0.7905
33	0.3575	0	0	0	0.5841	0	0.0584	0	0
34	0	0	0	0	0.2438	0	0	0.0788	0.6775
35	0.4408	0	0	0	0	0	0.4934	0	0.0658
Number of farms^b	3	1	1	2	9	5	4	14	18

^aDMU: Decision making unit.^bNumber of farms: Total number of farms for which they are a reference.