

Supplementary material:

Supplementary table 1. Environmental impacts per kilogram of body weight gain for bulls and heifers raised on slatted floors and deep bedding in Italian fattening systems

	Slatted floor bull	Slatted floor heifer	Deep bedding bull	Deep bedding heifer	Slatted floor early culled bull	Slatted floor early culled heifer	Deep bedding early culled bull	Deep bedding early culled heifer
GWP, kg CO ₂ - eq	7,64	9,96	6,34	8,50	8,35	10,94	7,06	9,42
Eutrophication potential, g PO ₄ ³⁻ -eq	47,81	64,29	53,14	75,42	52,36	70,63	59,17	83,83
Acidification potential, g SO ₂ -eq	107,74	153,57	91,42	148,33	117,51	168,88	101,78	164,19
Freshwater withdrawals, L	965	1217	883	1143	1051	1339	983	1263
Land occupation, inputs production, m ² *year	5,35	6,79	5,45	7,00	5,88	7,43	6,07	7,74

Supplementary table 2. Input data used for estimating environmental impact animals on slatted floor and deep bedding, including electricity and diesel consumption for farm practices.

	Slatted floor system		Deep bedding system	
Breed	Limousin		Charolais	
Sex	Bulls	Heifers	Bulls	Heifers
Heads (n)	894	458	3,312	1,010
Body weight initial (kg)	293	281	447	352
Body weight final (kg)	580	505	750	592
Length of fattening period (days)	196	187	184	187
Average daily gain (kg/day)	1.46	1.19	1.65	1.28
Dry matter intake per animal (kg/day)	8.88		9.95	
Mortality rate (%)	1	0.7	0.61	0.35
Average literature mortality rate (%)	0.88	0.83	1.07	0.95
Early culling rate (%)	0.2	0.1	2.6	2.01
Average literature early culling rate (%)	3.51	3.51	3.03	3.03
Farm electricity used (kWh)	54,876	146,042		
Diesel used for farm operation (kg)	18,827		61,010	

Supplementary table 3. Diet composition per systems (kg dry matter)

	Slatted floor diet 1 phase	Slatted floor diet 2 phase	Deep bedding diet 1 phase	Deep bedding diet 2 phase	Deep bedding diet 3 phase	Deep bedding diet 4 phase
Maize, silage	2.8	2.45	1.54	1.89	2.28	2.28
Maize, high moisture preserved grain	2.8	3.15	0.63	1.19	1.47	1.47
Sorghum, silage	0.6	-	0.24	0.24	0.24	0.24
Wheat, silage	-	0.7	0.21	0.25	0.25	0.18
Maize, dry distillers' grain and soluble	1.6	1.78	0.8	0.89	0.89	0.89
Maize, grain	-	0	0.86	1.29	2.58	3.35
Alfalfa, hay	-	-	1.55	0.77	0.6	0.6
Sugar beet, molasses	-	-	0.38	0.53	0.53	0.53
Sugar beet, pulp	-	-	0.71	0.62	0.53	0.53
Barley, silage	-	-	0.06	0.06	0.06	0.06
Concentrate (supplement)	0.94	0.94	1.04	1.49	1.39	1.64