Table S1. Donkey farm inventory for Real Scenario Model (RSM), in the framework of reference allocation. Output to the environment: 1% of exclusion

Input from technosphere

Materials	Transport	kg as fed	kg dry matter	Travel	Transport	Travel	kWh year⁻¹	kg
Grass at pasture	-	75 500	13 055	-	-	-	-	-
Mixed hay	Agricultural tractor	45 150	38 385	1 km (assumption)				
Oat grain	Agricultural tractor	16 600	14 250	1 km (assumption)				
Wheat straw	Agricultural tractor	3 200	2 900	1 km (assumption)				
Concentrate	Truck>32 metric ton	8 300	7 265	100 km (from the dealer to the farm gate)				
<u>Concentrate ingredients</u>					**Transport**	**Travel**		
Maize flower	Truck>32 metric ton	2 400	2 100	900 km (assumption)				
Maize (flaked/crushed)	Truck>32 metric ton	1 800	1 575	900 km (assumption)				
Oat (flaked)	Truck>32 metric ton	1 800	1 575	900 km (assumption)				
Wheat bran	Truck>32 metric ton	1 000	875	900 km (assumption)				
Soybean meal	Truck>32 metric ton	800	700	170 km (from the Italian harbour to the dealer)	Transoceanic cargo ship	10,000 km		
Dehydrated alfalfa	Truck>32 metric ton	500	435	900 km (assumption)				

Energy and chemicals

Materials	Transport	kg as fed	kg dry matter	Travel	Transport	Travel	kWh year^{-1}	kg
Diesel fuel	Truck 3.5 – 7.5 metric ton			30 km (from dealer to the farm, interview)				25 000
Electricity (energetic national mix)							150	
Organic nitrogen	Truck 3.5 – 7.5 metric ton			30 km (from dealer to the farm, interview)				1 320
Zeolite	Truck 3.5 – 7.5 metric ton			30 km (from dealer to the farm, interview)				280

Output to technosphere

Raw milk								3 700
Fattened males								5 200
Bread wheat grain								5 200
Durum wheat grain								5 000

Output to environment

Carbon dioxide								124 110
Methane								34 850
Dinitrogen monoxide								9 160
Ammonia								775
Nitrogen oxides								233
Sulfur dioxide								137
Nitrate								115
Phosphate								31

Table S2. Donkey farm inventory for Improved Milk Production Model (IMPM), in the framework of the reference allocation. Output to the environment: 1% of exclusion

Input from technosphere

Materials	Transport	kg as fed	kg dry matter	Travel	Transport	Travel	kWh year^{-1}	kg
Grass at pasture	-	75 500	13 055	-	-	-	-	
Mixed hay	Agricultural tractor	45 150	38 385	1 km (assumption)				
Oat grain	Agricultural tractor	16 600	14 250	1 km (assumption)				
Wheat straw	Agricultural tractor	3 200	2 900	1 km (assumption)				
Oat grain	Truck>32 metric ton	3 200	2 750	100 km (from the dealer to the farm gate)				
Concentrate	Truck>32 metric ton	9 500	8 315	100 km (from the dealer to the farm gate)				
<u>Concentrate ingredients</u>					**Transport**	**Travel**		
Maize flower	Truck>32 metric ton	2 750	2 405	900 km (assumption)				
Maize (flaked/crushed)	Truck>32 metric ton	2 050	1 795	900 km (assumption)				
Oat (flaked)	Truck>32 metric ton	2 050	1 795	900 km (assumption)				
Wheat bran	Truck>32 metric ton	1 140	995	900 km (assumption)				
Soybean meal	Truck>32 metric ton	915	610	170 km (from the Italian harbour to the dealer)	Transoceanic cargo ship	10 000 km		
Dehydrated alfalfa	Truck>32 metric ton	595	380	900 km (assumption)				
Energy and chemicals								

Materials	Transport	kg as fed	kg dry matter	Travel	Transport	Travel	kWh year^{-1}	kg
Diesel fuel	Truck 3.5 – 7.5 metric ton			30 km (from dealer to the farm, interview)				25 000
Electricity (energetic national mix)							1 500	
Organic nitrogen	Truck 3.5 – 7.5 metric ton			30 km (from dealer to the farm, interview)				1 320
Zeolite	Truck 3.5 – 7.5 metric ton			30 km (from dealer to the farm, interview)				280

Output to technosphere

Raw milk								29 000
Fattened males								5 200
Bread wheat grain								5 200
Durum wheat grain								5 000

Output to environment

Carbon dioxide								129 590
Methane								35 160
Dinitrogen monoxide								8 580
Ammonia								741
Nitrogen oxides								296
Sulfur dioxide								175
Nitrate								108
Phosphate								31