Journal of Agricultural Engineering

Appendix

Environmental impact assessment of three packages for high-quality extra-virgin olive oil

Antonio Guiso, Alessandro Parenti, Piernicola Masella, Lorenzo Guerrini, Fabio Baldi, Paolo Spugnoli

Supplementary materials

Journal of Agricultural Engineering 2016; XLVII:515_Appendix
doi: 10.4081/jae.2016.515

Appendix Table 1. Life cycle inventory of glass bottles.

GLASS	Size (l)	0.250	0.500	0.750	1000
Packaging glass production, green RER w/o CH+DE	kg	0.2560	0.3770	0.4840	0.5950
Corrugated board box {RER}| production | Alloc Def, U	kg	0.0389	0.0591	0.0744	0.0855
Transport, freight, lorry 16-32 metric ton, EURO3 {RER}*	tkm	0.1015	0.1556	0.1957	0.2435
Aluminum Cap	**Size**	**All bottle sizes**			
Aluminum, primary, ingot {UN-EUROPE}| production | Alloc Def, U	kg	0.0019			
Sheet rolling, aluminium {RER}| processing | Alloc Def, U	kg	0.0019			
Impact extrusion of aluminium, 1 stroke {RER}| processing | Alloc Def, U	kg	0.0019			
Drip Catcher*	**Size (l)**	**All bottle sizes**			
polyethylene terephthalate production, granulate, amorphous RER	kg	0.0030			
Injection moulding {RER}| processing | Alloc Def, U	kg	0.0030			

*1 kg of injected plastic is equal to 0.994 kg of finished product.

Appendix Table 2. Life cycle inventory of stainless steel bottles.

STAINLESS STEEL	Size (l)	0.100	0.250	0.500
Steel, chromium steel 18/8, hot rolled {RER}| production | Alloc Def, U	kg	0.0428	0.0781	0.1081
Impact extrusion of steel, cold, 1 strokes {RER}| processing | Alloc Def, U	kg	0.0428	0.0781	0.1081
Chromium steel removed by turning, average, computer numerical controlled {RER}(3)	kg	0.0030	0.0055	0.0076
Welding, arc, steel {RER}| processing | Alloc Def, U	m	0.1087	0.1630	0.4270
Transport, freight, lorry 16-32 metric ton, EURO3 {RER}*	tkm	0.0218	0.0350	0.0486
Cap and Drip Catcher*	**Size (l)**	**All bottle sizes**		
polyethylene terephthalate production, granulate, amorphous RER	kg	0.0104		
Injection moulding {RER}| processing | Alloc Def, U	kg	0.0104		

*1 kg of injected plastic is equal to 0.994 kg of finished product.

Appendix Table 3. Life cycle inventory of tin plated cans.

TIN PLATED CANS	Size (l)	0.25	0.5	1	3	5
Steel, low-alloyed, hot rolled {RER}| production | Alloc Def, U	kg	0.067	0.088	0.121	0.346	0.446
Tin plating, pieces {RER}| processing | Alloc Def, U	m^2	0.0447	0.0587	0.0807	0.2307	0.2973
Transport, freight, lorry 16-32 metric ton, EURO3 {RER}*	tkm	0.261209	0.34308	0.471735	1.348928	1.738791
Cap and Drip Catcher*	**Size**	**0.25**	**0.5**	**1**	**3**	**5**
polyethylene terephthalate production, granulate, amorphous RER	kg	0.0073			0.0115	
Injection moulding {RER}| processing | Alloc Def, U	kg	0.0073			0.0115	

*1 kg of injected plastic is equal to 0.994 kg of finished product.

Appendix Table 4. Life cycle inventory of end of life scenarios.

END OF LIFE (per kg of waste)		
Plastic		
Municipal waste collection service by 21 metric ton lorry {RoW}| processing | Alloc Def, U	tkm	0.02
Waste polyethylene terephtalate {CH}| treatment of, municipal incineration | Alloc Def, U	kg	0.273
Waste plastic, mixture {CH}| treatment of, sanitary landfill | Alloc Def, U	kg	0.491
Paper		
Municipal waste collection service by 21 metric ton lorry {RoW}| processing | Alloc Def, U	tkm	0.02
Waste paperboard {CH}| treatment of, municipal incineration | Alloc Def, U	kg	0.072
Waste paperboard {CH}| treatment of, sanitary landfill | Alloc Def, U	kg	0.128
Alluminium		
Municipal waste collection service by 21 metric ton lorry {RoW}| processing | Alloc Def, U		0.02
Waste aluminium {CH}| treatment of, sanitary landfill | Alloc Def, U	kg	0,176
Scrap aluminium {CH}| treatment of, municipal incineration | Alloc Def, S	kg	0.120
Steel		
Municipal waste collection service by 21 metric ton lorry {RoW}| processing | Alloc Def, U	tkm	0.02
Scrap steel {CH}| treatment of, municipal incineration | Alloc Def, S	kg	0.076
Scrap steel {CH}| treatment of, inert material landfill | Alloc Def, S	kg	0.182
Glass		
Municipal waste collection service by 21 metric ton lorry {RoW}| processing | Alloc Def, U	tkm	0.02
Waste glass {CH}| treatment of, inert material landfill | Alloc Def, U	kg	0.13
Waste glass {CH}| treatment of, municipal incineration | Alloc Def, S	kg	0.05