

Supplementary Materials

Table S1. Penalty points to calculate the Green Certificate and E-factor value for anthocyanin-rich extract and its cryoconcentrate from broken black bean hulls.

Product	Solvent					Energy		Waste	Total PPs	Green Certificate	E- factor
	Type	Quantity (mL)	PP _Q	PP _H	Subtotal (PP)	Consumption (kWh)	PP _E	PP _W			
Anthocyanin-rich extract	Water and DES	15	1	1	1.41	0.09	1	0.37	2.79	97.21	268.16
Cryoconcentrate 1	Water and DES	15	1	1	1.41	3.72	3	0.92	5.34	94.66	1432.30
Cryoconcentrate 2	Water and DES	15	1	1	1.41	7.36	4	1.27	6.69	93.31	3477.33
Cryoconcentrate 3	Water and DES	15	1	1	1.41	10.99	5	1.36	7.78	92.22	4856.36

PPQ – penalty point for solvent quantity, PPH – penalty point for solvent hazard, PPE – penalty point for energy consumption, PPW - penalty point for waste volume, PPS – penalty points.

Table S2. Penalty points to calculate the EcoScale for anthocyanin-rich extract and its cryoconcentrate from broken black bean hulls.

Penalties										
Product	Solvent	Yield*	Cost s	Safety	Technical setup	Temperature / time	Workup and purification	Total	EcoScale	
Anthocyanin-rich extract	Water and DES	12.71	0	5	2	2	0	1	78.29	
Cryoconcentrate 1	Water and DES	12.71	3	5	7	5	1	1	66.29	
Cryoconcentrate 2	Water and DES	12.71	5	5	7	5	1	1	64.29	
Cryoconcentrate 3	Water and DES	12.71	5	5	7	5	1	1	64.29	

Yield – [100-%anthocyanin recovered]/2, being % recovered in relation to maximum anthocyanin reported in the literature (4.8 mg/g) [10].