

Appendices

A Sorting results per municipality – separate collection

B Sorting results per municipality – collection with plastic as carrier

C Sorting results per municipality – collection with paper and board as carrier

D Sorting results recovery

E Mechanical properties of hand-sheets and pulps

F Recommendations review committee, 3th December 2013

A Sorting results per municipality – separate collection

List of municipalities:

- Apeldoorn
- Beesel
- Bernheze
- Bronckhorst
- Deventer
- Genneep
- Gorinchem
- Hengelo
- Katwijk
- Leeuwarden
- Oldambt
- Oosterhout
- Oude ijsselstreek
- Overbetuwe
- Roermond-Swalmen
- Rotterdam
- Schiedam
- Son en Breughel
- Stadskanaal
- Tilburg
- Voorst
- Zoetermeer
- Zutphen

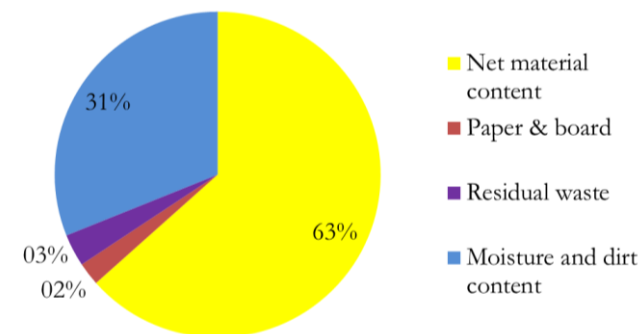
¹ Gross material content [%] calculated based on total weight of sample

² Moisture and dirt content [%] calculated per category

Municipality	Apeldoorn	Date of sampling	11-10-2013
Volume of sample	1 m ³ bigbag	Density of sample	64 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	14789	23,1%	26,9%
Milk cartons < 1 ltr	159	0,2%	26,6%
UHT milk cartons ≥ 1 ltr	4364	6,8%	23,6%
UHT milk cartons < 1 ltr	141	0,2%	33,3%
Yoghurt & dessert cartons ≥ 1 ltr	15284	23,9%	51,3%
Yoghurt & dessert cartons < 1 ltr	307	0,5%	42,0%
Juice cartons ≥ 1 ltr	16061	25,1%	22,5%
Juice cartons < 1 ltr	706	1,1%	33,6%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	4453	7,0%	35,8%
Cartons with fresh mixes of juice & dairy < 1 ltr	371	0,6%	51,3%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	756	1,2%	35,4%
Cartons with UHT mixes of juice & dairy < 1 ltr	103	0,2%	26,0%
Residual cartons ≥ 1 ltr	1857	2,9%	30,1%
Residual cartons < 1 ltr	1050	1,6%	30,5%
Paper & board	1466	2,3%	
Plastics	1120	1,8%	
Organic waste and indefinable waste	405	0,6%	
Textile	0	0,0%	
Metals < 100 gram	307	0,5%	
Metals ≥ 100 gram	74	0,1%	
Glass	149	0,2%	
Total	63922	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
40,5	29,6	10,9
19,3	14,1	5,1
39,9	30,5	9,4
12,6	8,4	4,2
55,6	27,1	28,5
32,0	18,6	13,4
53,3	41,3	12,0
13,1	8,7	4,4
43,6	28,0	15,6
35,7	17,4	18,3
44,6	28,8	15,8
11,1	8,2	2,9
49,8	34,8	15,0
26,9	18,7	8,2

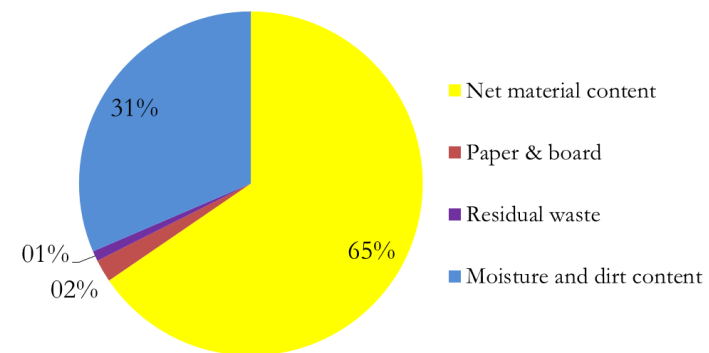


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Municipality	Beesel	Date of sampling	21-10-2013
Volume of sample	1 m ³ bigbag	Density of sample	28 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%] ¹	Moisture and dirt content [%] ²
Milk cartons ≥ 1 ltr	1586	5,7%	14,8%
Milk cartons < 1 ltr	0	0,0%	0,0%
UHT milk cartons ≥ 1 ltr	7959	28,8%	21,2%
UHT milk cartons < 1 ltr	231	0,8%	21,5%
Yoghurt & dessert cartons ≥ 1 ltr	6542	23,7%	60,5%
Yoghurt & dessert cartons < 1 ltr	267	1,0%	27,9%
Juice cartons ≥ 1 ltr	6181	22,4%	18,6%
Juice cartons < 1 ltr	108	0,4%	21,5%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	1839	6,7%	38,3%
Cartons with fresh mixes of juice & dairy < 1 ltr	131	0,5%	42,6%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	567	2,1%	40,8%
Cartons with UHT mixes of juice & dairy < 1 ltr	12	0,0%	18,2%
Residual cartons ≥ 1 ltr	297	1,1%	32,0%
Residual cartons < 1 ltr	1027	3,7%	40,5%
Paper & board	585	2,1%	
Plastics	244	0,9%	
Organic waste and indefinable waste	14	0,1%	
Textile	0	0,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	8	0,0%	
Glass	0	0,0%	
Total	1586	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
37,8	32,2	5,6
36,8	29	7,8
10,7	8,4	2,3
72,6	28,7	43,9
25,1	18,1	7
52,1	42,4	9,7
10,7	8,4	2,3
52,8	32,6	20,2
32,3	18,5	13,75
50,7	30	20,7
11,0	9	2
45,3	30,8	14,5
28,4	16,9	11,5

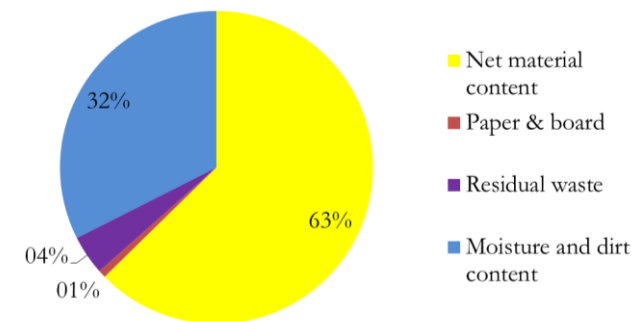


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Municipality	Bernheze	Date of sampling	16-10-2013
Volume of sample	1 m ³ bigbag	Density of sample	32 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	3370	10,5%	20,1%
Milk cartons < 1 ltr	64	0,2%	19,4%
UHT milk cartons ≥ 1 ltr	4949	15,4%	37,6%
UHT milk cartons < 1 ltr	116	0,4%	13,7%
Yoghurt & dessert cartons ≥ 1 ltr	8019	24,9%	53,1%
Yoghurt & dessert cartons < 1 ltr	268	0,8%	22,4%
Juice cartons ≥ 1 ltr	9931	30,8%	25,4%
Juice cartons < 1 ltr	240	0,7%	21,5%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	1446	4,5%	29,1%
Cartons with fresh mixes of juice & dairy < 1 ltr	21	0,1%	9,5%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	1031	3,2%	32,1%
Cartons with UHT mixes of juice & dairy < 1 ltr	122	0,4%	26,6%
Residual cartons ≥ 1 ltr	311	1,0%	15,4%
Residual cartons < 1 ltr	750	2,3%	21,8%
Paper & board	254	0,8%	
Plastics	1318	4,1%	
Organic waste and indefinable waste	0	0,0%	
Textile	0	0,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	0	0,0%	
Glass	0	0,0%	
Total	32210	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
35,3	28,2	7,1
20,7	16,7	4,0
46,6	29,1	17,5
9,5	8,2	1,3
59,0	27,7	31,3
22,3	17,3	5,0
53,1	39,6	13,5
10,7	8,4	2,3
38,5	27,3	11,2
21,0	19,0	2,0
45,2	30,7	14,5
10,9	8,0	2,9
44,4	37,6	6,9
14,2	11,1	3,1

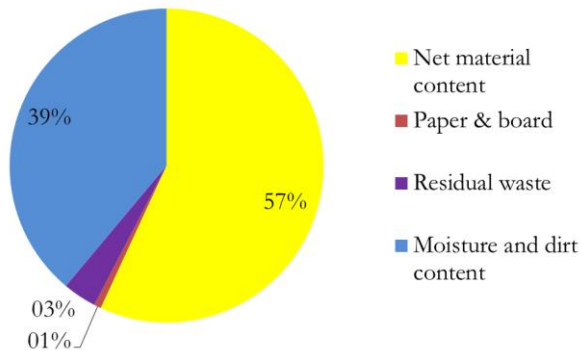


Notes	Plastic collection bags: 1292 kg, included in plastic amount
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Municipality	Bronckhorst	Date of sampling	26-06-2013
Volume of sample	1 m ³ bigbag	Density of sample	43 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	7118	16,7%	24,7%
Milk cartons < 1 ltr	135	0,3%	13,1%
UHT milk cartons ≥ 1 ltr	2073	4,9%	24,2%
UHT milk cartons < 1 ltr	145	0,3%	28,4%
Yoghurt & dessert cartons ≥ 1 ltr	15012	35,2%	59,1%
Yoghurt & dessert cartons < 1 ltr	548	1,3%	51,6%
Juice cartons ≥ 1 ltr	9354	21,9%	29,2%
Juice cartons < 1 ltr	538	1,3%	19,6%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	2680	6,3%	42,4%
Cartons with fresh mixes of juice & dairy < 1 ltr	219	0,5%	42,9%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	820	1,9%	43,4%
Cartons with UHT mixes of juice & dairy < 1 ltr	74	0,2%	55,7%
Residual cartons ≥ 1 ltr	1398	3,3%	37,3%
Residual cartons < 1 ltr	781	1,8%	18,1%
Paper & board	307	0,7%	
Plastics	267	0,6%	
Organic waste and indefinable waste	216	0,5%	
Textile	0	0,0%	
Metals < 100 gram	237	0,6%	
Metals ≥ 100 gram	15	0,0%	
Glass	748	1,8%	
Total	42685	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
36,1	27,2	8,9
18,6	16,1	2,4
41,7	31,6	10,1
11,6	8,3	3,3
66,8	27,3	39,5
47,5	23,0	24,5
61,2	43,3	17,9
10,7	8,6	2,1
53,5	30,8	22,7
31,3	17,9	13,4
53,4	30,2	23,2
17,5	7,8	9,8
56,9	35,7	21,2
23,7	19,4	4,3

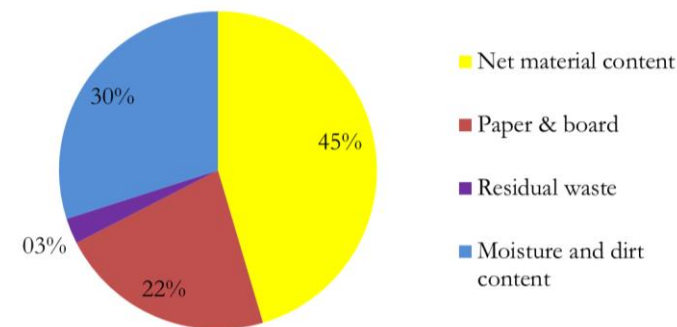


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Municipality	Deventer	Date of sampling	11-10-2013
Volume of sample	1 m ³ bigbag	Density of sample	55 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%] ¹	Moisture and dirt content [%] ²
Milk cartons ≥ 1 ltr	9614	17,4%	29,2%
Milk cartons < 1 ltr	27	0,0%	29,6%
UHT milk cartons ≥ 1 ltr	1917	3,5%	31,2%
UHT milk cartons < 1 ltr	44	0,1%	22,7%
Yoghurt & dessert cartons ≥ 1 ltr	13399	24,2%	61,5%
Yoghurt & dessert cartons < 1 ltr	319	0,6%	54,7%
Juice cartons ≥ 1 ltr	9195	16,6%	22,0%
Juice cartons < 1 ltr	453	0,8%	19,6%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	3820	6,9%	44,3%
Cartons with fresh mixes of juice & dairy < 1 ltr	27	0,0%	33,3%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	979	1,8%	41,0%
Cartons with UHT mixes of juice & dairy < 1 ltr	36	0,1%	23,5%
Residual cartons ≥ 1 ltr	794	1,4%	21,5%
Residual cartons < 1 ltr	1090	2,0%	31,3%
Paper & board	12189	22,0%	
Plastics	1041	1,9%	
Organic waste and indefinable waste	24	0,0%	
Textile	0	0,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	241	0,4%	
Glass	139	0,3%	
Total	55348	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
41,1	29,1	12,0
27,0	19,0	8,0
44,3	30,5	13,8
11,0	8,5	2,5
74,5	28,7	45,8
35,1	15,9	19,2
53,1	41,4	11,7
10,2	8,2	2,0
57,6	32,1	25,5
27,0	18,0	9,0
50,3	29,7	20,6
11,3	8,7	2,7
41,8	32,8	9,0
21,4	14,7	6,7

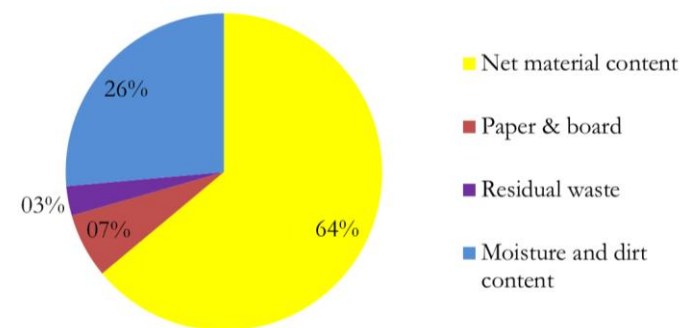


Notes	Plastic collection bags: 374 kg, included in plastic amount
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Municipality	Gennep	Date of sampling	25-10-2013
Volume of sample	1 m ³ bigbag	Density of sample	82 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%] ¹	Moisture and dirt content [%] ²
Milk cartons ≥ 1 ltr	8029	9,8%	22,7%
Milk cartons < 1 ltr	140	0,2%	19,3%
UHT milk cartons ≥ 1 ltr	13416	16,4%	34,0%
UHT milk cartons < 1 ltr	169	0,2%	24,5%
Yoghurt & dessert cartons ≥ 1 ltr	12045	14,7%	37,5%
Yoghurt & dessert cartons < 1 ltr	286	0,3%	41,2%
Juice cartons ≥ 1 ltr	24737	30,2%	22,2%
Juice cartons < 1 ltr	532	0,6%	21,2%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	5800	7,1%	35,1%
Cartons with fresh mixes of juice & dairy < 1 ltr	240	0,3%	40,6%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	1443	1,8%	34,2%
Cartons with UHT mixes of juice & dairy < 1 ltr	37	0,0%	28,9%
Residual cartons ≥ 1 ltr	4852	5,9%	30,6%
Residual cartons < 1 ltr	2312	2,8%	35,7%
Paper & board	5417	6,6%	
Plastics	1350	1,6%	
Organic waste and indefinable waste	0	0,0%	
Textile	0	0,0%	
Metals < 100 gram	128	0,2%	
Metals ≥ 100 gram	567	0,7%	
Glass	416	0,5%	
Total	81916	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
36,5	28,2	8,3
23,3	18,8	4,5
43,0	28,4	14,6
10,6	8,0	2,6
42,9	26,8	16,1
28,4	16,7	11,7
54,0	42,0	12,0
10,4	8,2	2,2
43,9	28,5	15,4
29,9	17,8	12,1
44,1	29,0	15,1
12,7	9,0	3,7
46,4	32,2	14,2
22,1	14,2	7,9

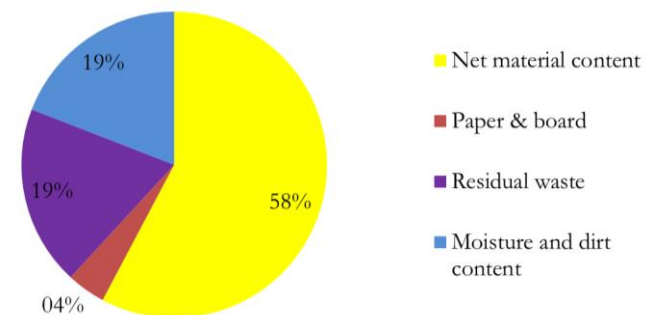


Notes	Plastic collection bags: 141 kg, included in plastic amount
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Municipality	Gorinchem	Date of sampling	11-10-2013
Volume of sample	1 m ³ bigbag	Density of sample	24 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	5724	24,3%	17,8%
Milk cartons < 1 ltr	70	0,3%	9,9%
UHT milk cartons ≥ 1 ltr	1604	6,8%	27,6%
UHT milk cartons < 1 ltr	12	0,1%	33,3%
Yoghurt & dessert cartons ≥ 1 ltr	2492	10,6%	40,1%
Yoghurt & dessert cartons < 1 ltr	225	1,0%	28,6%
Juice cartons ≥ 1 ltr	5127	21,7%	24,4%
Juice cartons < 1 ltr	104	0,4%	22,3%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	429	1,8%	49,1%
Cartons with fresh mixes of juice & dairy < 1 ltr	161	0,7%	34,8%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	209	0,9%	33,3%
Cartons with UHT mixes of juice & dairy < 1 ltr	0	0,0%	0,0%
Residual cartons ≥ 1 ltr	1748	7,4%	17,8%
Residual cartons < 1 ltr	231	1,0%	21,6%
Paper & board	967	4,1%	
Plastics	4487	19,0%	
Organic waste and indefinable waste	0	0,0%	
Textile	0	0,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	0	0,0%	
Glass	0	0,0%	
Total	23590	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
33,1	27,2	5,9
17,8	16,0	1,8
39,9	28,9	11,0
12,0	8,0	4,0
45,6	27,3	18,3
22,7	16,2	6,5
57,3	43,3	14,0
10,3	8,0	2,3
53,8	27,4	26,4
26,8	17,5	9,3
42,0	28,0	14,0
45,6	37,5	8,1
25,7	20,1	5,6

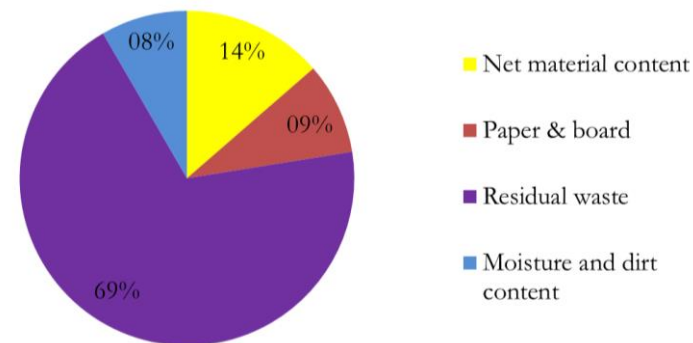


Notes	Plastic collection bags: 650 kg and plastic carrier bags for collection 162, included in plastic amount
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Municipality	Hengelo	Date of sampling	05-09-2013
Volume of sample	4 $\frac{1}{3}$ x 1 m ³ bigbag	Density of sample	103 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	20827	4,7%	30,3%
Milk cartons < 1 ltr	539	0,1%	17,6%
UHT milk cartons ≥ 1 ltr	12224	2,7%	28,7%
UHT milk cartons < 1 ltr	836	0,2%	38,9%
Yoghurt & dessert cartons ≥ 1 ltr	24020	5,4%	55,6%
Yoghurt & dessert cartons < 1 ltr	357	0,1%	44,6%
Juice cartons ≥ 1 ltr	22277	5,0%	30,2%
Juice cartons < 1 ltr	1552	0,3%	18,9%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	6850	1,5%	49,8%
Cartons with fresh mixes of juice & dairy < 1 ltr	946	0,2%	83,4%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	832	0,2%	39,0%
Cartons with UHT mixes of juice & dairy < 1 ltr	80	0,0%	24,4%
Residual cartons ≥ 1 ltr	5189	1,2%	28,6%
Residual cartons < 1 ltr	1915	0,4%	35,5%
Paper & board	39637	8,9%	
Plastics	50990	11,4%	
Organic waste and indefinable waste	204180	45,6%	
Textile	12182	2,7%	
Metals < 100 gram	1351	0,3%	
Metals ≥ 100 gram	10028	2,2%	
Glass	30966	6,9%	
Total	447778	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
38,9	27,1	11,8
21,5	17,7	3,8
42,5	30,3	12,2
13,8	8,4	5,4
60,7	26,9	33,8
29,0	16,1	12,9
58,1	40,6	17,5
10,5	8,5	2,0
56,0	28,1	27,9
103,7	17,2	86,4
48,8	29,8	19,0
26,0	19,7	6,3
45,2	32,3	12,9
23,2	14,9	8,2

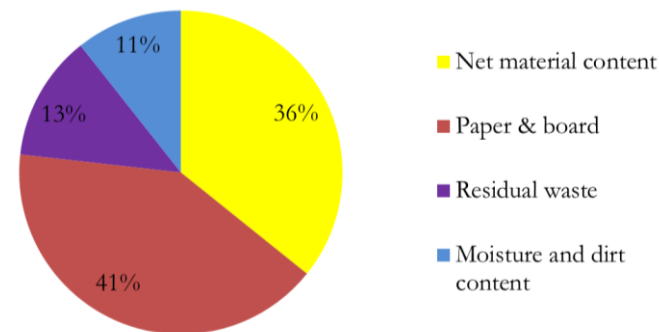


Notes	Relatively a big amount of organic waste
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Municipality	Katwijk	Date of sampling	19-07-2013
Volume of sample	1 m ³ bigbag	Density of sample	46 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	6147	13,3%	14,7%
Milk cartons < 1 ltr	39	0,1%	12,8%
UHT milk cartons ≥ 1 ltr	742	1,6%	34,9%
UHT milk cartons < 1 ltr	0	0,0%	0,0%
Yoghurt & dessert cartons ≥ 1 ltr	3406	7,4%	35,8%
Yoghurt & dessert cartons < 1 ltr	137	0,3%	31,4%
Juice cartons ≥ 1 ltr	6983	15,1%	20,9%
Juice cartons < 1 ltr	90	0,2%	16,9%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	2424	5,3%	27,3%
Cartons with fresh mixes of juice & dairy < 1 ltr	193	0,4%	31,3%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	202	0,4%	34,3%
Cartons with UHT mixes of juice & dairy < 1 ltr	46	0,1%	24,4%
Residual cartons ≥ 1 ltr	762	1,7%	16,5%
Residual cartons < 1 ltr	229	0,5%	33,9%
Paper & board	18909	41,0%	
Plastics	2456	5,3%	
Organic waste and indefinable waste	2151	4,7%	
Textile	0	0,0%	
Metals < 100 gram	346	0,8%	
Metals ≥ 100 gram	57	0,1%	
Glass	782	1,7%	
Total	46101	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
33,4	28,5	4,9
19,5	17,0	2,5
44,7	29,1	15,6
57,8	37,1	20,7
27,4	18,8	8,6
50,6	40,0	10,6
9,9	8,2	1,7
37,7	27,4	10,3
27,4	18,9	8,6
45,3	29,8	15,5
15,0	11,3	3,7
47,3	39,5	7,8
25,2	16,7	8,6

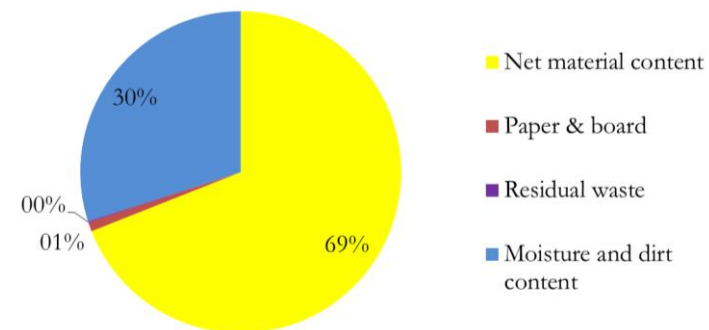


Notes	A lot of residual waste and carton board is found. Katwijk uses open containers for the collection of beverage cartons.
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Municipality	Leeuwarden	Date of sampling	24-10-2013
Volume of sample	1 $\frac{1}{2}$ m ³ bigbag	Density of sample	52 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	11684	15,0%	16,2%
Milk cartons < 1 ltr	185	0,2%	23,6%
UHT milk cartons ≥ 1 ltr	13175	16,9%	21,8%
UHT milk cartons < 1 ltr	89	0,1%	42,7%
Yoghurt & dessert cartons ≥ 1 ltr	18019	23,2%	53,6%
Yoghurt & dessert cartons < 1 ltr	471	0,6%	30,4%
Juice cartons ≥ 1 ltr	18930	24,3%	22,3%
Juice cartons < 1 ltr	314	0,4%	18,4%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	7717	9,9%	35,0%
Cartons with fresh mixes of juice & dairy < 1 ltr	126	0,2%	50,4%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	2571	3,3%	35,8%
Cartons with UHT mixes of juice & dairy < 1 ltr	0	0,0%	0,0%
Residual cartons ≥ 1 ltr	2239	2,9%	15,6%
Residual cartons < 1 ltr	1445	1,9%	22,4%
Paper & board	719	0,9%	
Plastics	91	0,1%	
Organic waste and indefinable waste	0	0,0%	
Textile	0	0,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	9	0,0%	
Glass	0	0,0%	
Total	77784	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
32,7	27,4	5,3
26,0	19,9	6,1
37,1	29,0	8,1
14,8	8,5	6,3
61,7	28,6	33,1
27,6	19,2	8,4
51,2	39,8	11,4
10,3	8,4	1,9
43,2	28,1	15,1
31,3	15,5	15,8
48,6	31,2	17,4
41,7	35,2	6,5
22,8	17,7	5,1

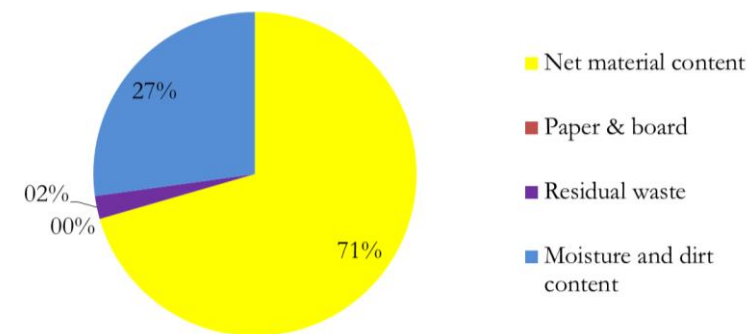


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Municipality	Oldambt	Date of sampling	19-09-2013
Volume of sample	1 m ³ bigbag	Density of sample	42 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	3652	8,7%	26,5%
Milk cartons < 1 ltr	20	0,0%	15,0%
UHT milk cartons ≥ 1 ltr	11033	26,2%	17,5%
UHT milk cartons < 1 ltr	73	0,2%	31,9%
Yoghurt & dessert cartons ≥ 1 ltr	5813	13,8%	51,4%
Yoghurt & dessert cartons < 1 ltr	676	1,6%	68,4%
Juice cartons ≥ 1 ltr	13229	31,4%	16,8%
Juice cartons < 1 ltr	302	0,7%	21,5%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	2942	7,0%	49,4%
Cartons with fresh mixes of juice & dairy < 1 ltr	0	0,0%	0,0%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	1093	2,6%	43,1%
Cartons with UHT mixes of juice & dairy < 1 ltr	21	0,0%	19,0%
Residual cartons ≥ 1 ltr	786	1,9%	32,0%
Residual cartons < 1 ltr	1505	3,6%	39,8%
Paper & board	4	0,0%	
Plastics	955	2,3%	
Organic waste and indefinable waste	14	0,0%	
Textile	0	0,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	0	0,0%	
Glass	0	0,0%	
Total	42118	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
39,6	29,1	10,5
20,0	17,0	3,0
34,3	28,3	6,0
12,0	8,2	3,8
57,6	28,0	29,6
62,7	19,8	42,9
52,3	43,5	8,8
10,7	8,4	2,3
54,7	27,7	27,0
50,8	28,9	21,9
10,5	8,5	2,0
48,8	33,2	15,6
25,1	15,1	10,0

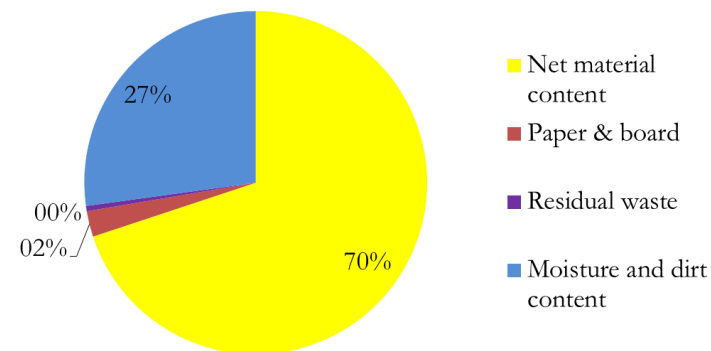


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Municipality	Oosterhout	Date of sampling	27-5-2013
Volume of sample	1 m ³ bigbag	Density of sample	34 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	7147	21,2%	18,4%
Milk cartons < 1 ltr	255	0,8%	15,5%
UHT milk cartons ≥ 1 ltr	2213	6,6%	27,1%
UHT milk cartons < 1 ltr	92	0,3%	17,4%
Yoghurt & dessert cartons ≥ 1 ltr	7018	20,8%	44,6%
Yoghurt & dessert cartons < 1 ltr	115	0,3%	16,7%
Juice cartons ≥ 1 ltr	10570	31,4%	25,2%
Juice cartons < 1 ltr	384	1,1%	23,1%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	1233	3,7%	34,4%
Cartons with fresh mixes of juice & dairy < 1 ltr	59	0,2%	44,8%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	341	1,0%	22,6%
Cartons with UHT mixes of juice & dairy < 1 ltr	82	0,2%	29,6%
Residual cartons ≥ 1 ltr	2327	6,9%	18,7%
Residual cartons < 1 ltr	881	2,6%	33,7%
Paper & board	817	2,4%	
Plastics	80	0,2%	
Organic waste and indefinable waste	80	0,2%	
Textile	0	0,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	7	0,0%	
Glass	0	0,0%	
Total	33701	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
36,5	29,8	6,7
25,1	21,2	3,9
39,8	29,0	10,8
10,2	8,4	1,8
48,4	26,8	21,6
22,0	18,3	3,7
54,4	40,7	13,7
10,4	8,0	2,4
43,9	28,8	15,1
29,0	16,0	13,0
37,8	29,2	8,6
11,6	8,1	3,4
52,3	42,5	9,8
20,2	13,4	6,8

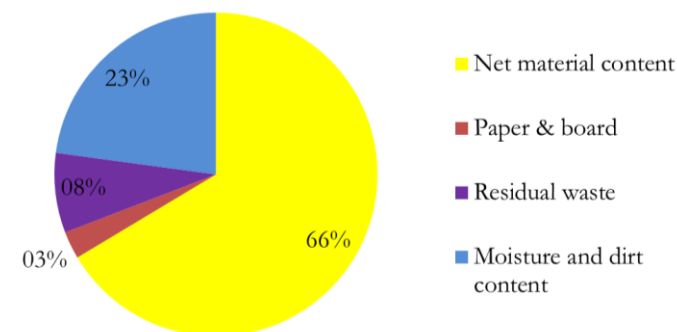


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Municipality	Oude ijsselstreek	Date of sampling	26-06-2013
Volume of sample	1 m ³ bigbag	Density of sample	210 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	50292	24,0%	21,1%
Milk cartons < 1 ltr	141	0,1%	26,2%
UHT milk cartons ≥ 1 ltr	20293	9,7%	27,3%
UHT milk cartons < 1 ltr	165	0,1%	31,4%
Yoghurt & dessert cartons ≥ 1 ltr	35831	17,1%	38,1%
Yoghurt & dessert cartons < 1 ltr	55	0,0%	28,6%
Juice cartons ≥ 1 ltr	54687	26,1%	20,1%
Juice cartons < 1 ltr	2527	1,2%	26,9%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	11404	5,4%	31,5%
Cartons with fresh mixes of juice & dairy < 1 ltr	390	0,2%	30,5%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	3263	1,6%	23,2%
Cartons with UHT mixes of juice & dairy < 1 ltr	382	0,2%	28,3%
Residual cartons ≥ 1 ltr	4465	2,1%	22,4%
Residual cartons < 1 ltr	3355	1,6%	22,3%
Paper & board	5772	2,8%	
Plastics	16055	7,7%	
Organic waste and indefinable waste	515	0,2%	
Textile	25	0,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	3	0,0%	
Glass	128	0,1%	
Total	209748	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
40,2	31,7	8,5
20,1	14,9	5,3
41,4	30,1	11,3
11,8	8,1	3,7
44,1	27,3	16,8
28,0	20,0	8,0
55,6	44,4	11,2
11,9	8,7	3,2
38,7	26,5	12,2
24,3	16,9	7,4
37,9	29,1	8,8
11,3	8,1	3,2
46,4	36,0	10,4
22,9	17,8	5,1

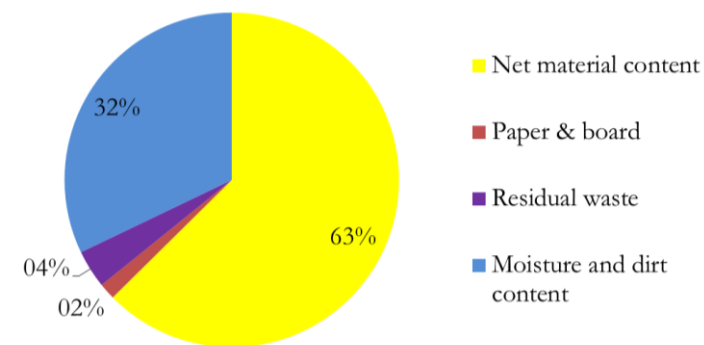


Notes	Pressed material
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Municipality	Overbetuwe	Date of sampling	11-06-2013
Volume of sample	1 m ³ bigbag	Density of sample	32 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%] ¹	Moisture and dirt content [%] ²
Milk cartons ≥ 1 ltr	6158	19,5%	28,7%
Milk cartons < 1 ltr	120	0,4%	28,3%
UHT milk cartons ≥ 1 ltr	1858	5,9%	21,9%
UHT milk cartons < 1 ltr	51	0,2%	32,0%
Yoghurt & dessert cartons ≥ 1 ltr	5695	18,1%	64,3%
Yoghurt & dessert cartons < 1 ltr	44	0,1%	14,9%
Juice cartons ≥ 1 ltr	10079	32,0%	25,0%
Juice cartons < 1 ltr	314	1,0%	25,9%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	2967	9,4%	33,6%
Cartons with fresh mixes of juice & dairy < 1 ltr	42	0,1%	52,4%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	578	1,8%	34,8%
Cartons with UHT mixes of juice & dairy < 1 ltr	460	1,5%	31,1%
Residual cartons ≥ 1 ltr	655	2,1%	11,8%
Residual cartons < 1 ltr	835	2,6%	22,1%
Paper & board	501	1,6%	
Plastics	281	0,9%	
Organic waste and indefinable waste	451	1,4%	
Textile	0	0,0%	
Metals < 100 gram	121	0,4%	
Metals ≥ 100 gram	0	0,0%	
Glass	312	1,0%	
Total	31522	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
39,0	27,8	11,2
30,0	21,5	8,5
36,6	28,6	8,0
12,5	8,5	4,0
76,8	27,4	49,4
23,5	20,0	3,5
56,8	42,6	14,2
11,6	8,6	3,0
44,0	29,2	14,8
38,9	18,5	20,4
42,0	27,4	14,6
12,2	8,4	3,8
77,1	68,0	9,1
20,8	16,2	4,6

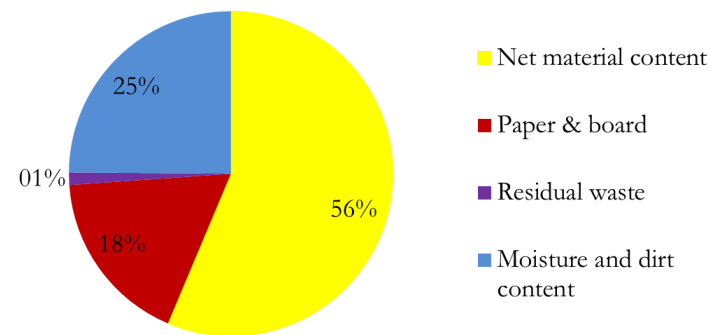


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Municipality	Roermond-Swalmen	Date of sampling	13-05-2013
Volume of sample	1 m ³ bigbag	Density of sample	38 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%] ¹	Moisture and dirt content [%] ²
Milk cartons ≥ 1 ltr	2901	7,6%	30,3%
Milk cartons < 1 ltr	76	0,2%	22,4%
UHT milk cartons ≥ 1 ltr	9462	24,8%	30,3%
UHT milk cartons < 1 ltr	68	0,2%	27,5%
Yoghurt & dessert cartons ≥ 1 ltr	4383	11,5%	44,9%
Yoghurt & dessert cartons < 1 ltr	83	0,2%	30,1%
Juice cartons ≥ 1 ltr	8695	22,8%	21,4%
Juice cartons < 1 ltr	224	0,6%	22,0%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	1886	4,9%	46,7%
Cartons with fresh mixes of juice & dairy < 1 ltr	416	1,1%	56,4%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	661	1,7%	31,6%
Cartons with UHT mixes of juice & dairy < 1 ltr	25	0,1%	32,0%
Residual cartons ≥ 1 ltr	1108	2,9%	28,1%
Residual cartons < 1 ltr	1049	2,7%	17,1%
Paper & board	6701	17,5%	
Plastics	291	0,8%	
Organic waste and indefinable waste	163	0,4%	
Textile	0	0,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	0	0,0%	
Glass	19	0,0%	
Total	38211	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
40,9	28,5	12,4
25,3	19,7	5,7
41,6	29,0	12,6
11,5	8,3	3,2
59,9	33,0	26,9
27,7	19,3	8,3
54,3	42,7	11,6
10,9	8,5	2,4
52,9	28,2	24,7
41,5	18,1	23,4
43,3	29,6	13,7
12,5	8,5	4,0
49,8	35,8	14,0
21,1	17,5	3,6

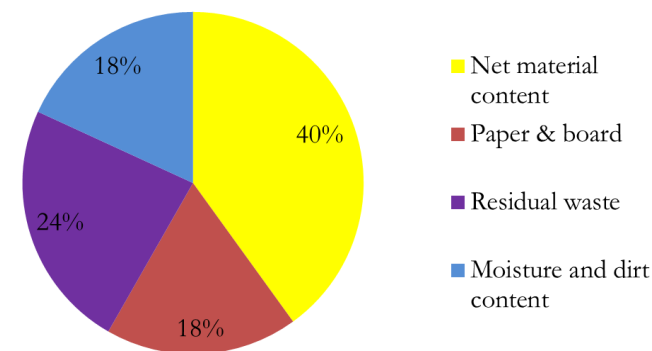


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Municipality	Rotterdam	Date of sampling	28-08-2013
Volume of sample	1 m ³ bigbag	Density of sample	43 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%] ¹	Moisture and dirt content [%] ²
Milk cartons ≥ 1 ltr	7093	16,6%	28,4%
Milk cartons < 1 ltr	338	0,8%	15,3%
UHT milk cartons ≥ 1 ltr	1145	2,7%	24,3%
UHT milk cartons < 1 ltr	48	0,1%	29,8%
Yoghurt & dessert cartons ≥ 1 ltr	5334	12,5%	53,5%
Yoghurt & dessert cartons < 1 ltr	0	0,0%	0,0%
Juice cartons ≥ 1 ltr	6416	15,1%	19,2%
Juice cartons < 1 ltr	133	0,3%	12,9%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	1453	3,4%	47,1%
Cartons with fresh mixes of juice & dairy < 1 ltr	144	0,3%	25,0%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	0	0,0%	19,4%
Cartons with UHT mixes of juice & dairy < 1 ltr	37	0,1%	0,0%
Residual cartons ≥ 1 ltr	2285	5,4%	20,5%
Residual cartons < 1 ltr	371	0,9%	25,3%
Paper & board	7776	18,2%	
Plastics	1825	4,3%	
Organic waste and indefinable waste	7187	16,9%	
Textile	600	1,4%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	119	0,3%	
Glass	312	0,7%	
Total		100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
39,4	28,2	11,2
19,6	16,6	3
37,5	28,4	9,1
11,8	8,25	3,5
57,8	26,9	30,9
45,9	37,1	8,8
12,4	10,8	1,6
52,7	27,9	24,8
24,0	18	6
36,0	29	7
51,8	41,2	10,6
27,7	20,7	7

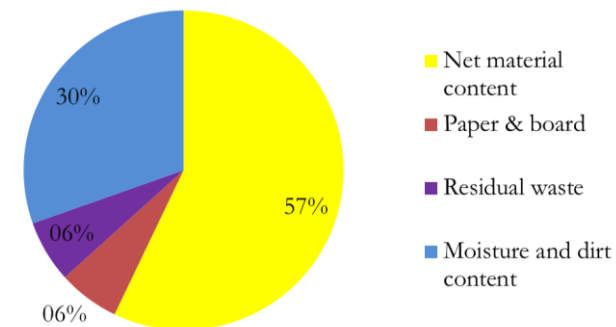


Notes	Relatively big amount of organic waste. Indoor container
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Municipality	Schiedam	Date of sampling	19-09-2013
Volume of sample	1 m ³ bigbag	Density of sample	46 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	6128	26,6%	32,7%
Milk cartons < 1 ltr	468	2,0%	15,4%
UHT milk cartons ≥ 1 ltr	1087	4,7%	26,7%
UHT milk cartons < 1 ltr	18	0,1%	11,1%
Yoghurt & dessert cartons ≥ 1 ltr	4236	18,4%	55,9%
Yoghurt & dessert cartons < 1 ltr	101	0,4%	20,0%
Juice cartons ≥ 1 ltr	4990	21,7%	27,6%
Juice cartons < 1 ltr	135	0,6%	28,5%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	588	2,6%	45,9%
Cartons with fresh mixes of juice & dairy < 1 ltr	90	0,4%	58,2%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	0	0,0%	0,0%
Cartons with UHT mixes of juice & dairy < 1 ltr	22	0,1%	63,6%
Residual cartons ≥ 1 ltr	1909	8,3%	21,5%
Residual cartons < 1 ltr	391	1,7%	22,4%
Paper & board	1430	6,2%	
Plastics	248	1,1%	
Organic waste and indefinable waste	1191	5,2%	
Textile	0	0,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	9	0,0%	
Glass	0	0,0%	
Total	23041	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
41,0	27,6	13,4
25,3	21,4	3,9
42,7	31,3	11,4
9,0	8,0	1,0
65,6	28,9	36,7
20,0	16,0	4,0
55,1	39,9	15,2
12,3	8,8	3,5
58,4	31,6	26,8
45,5	19,0	26,5
22,0	8,0	14,0
51,7	40,6	11,1
22,8	17,7	5,1

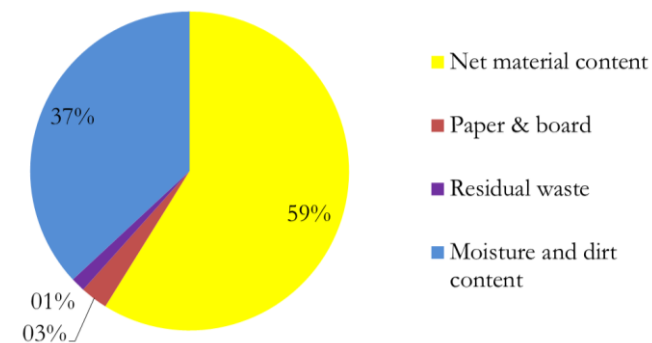


Notes	Relatively big amount of organic waste, waste of painting and wood.
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Municipality	Son en Breughel	Date of sampling	16-10-2013
Volume of sample	1 m ³ bigbag	Density of sample	33 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	7371	22,3%	27,3%
Milk cartons < 1 ltr	257	0,8%	31,2%
UHT milk cartons ≥ 1 ltr	4880	14,8%	35,9%
UHT milk cartons < 1 ltr	58	0,2%	57,1%
Yoghurt & dessert cartons ≥ 1 ltr	9063	27,4%	51,3%
Yoghurt & dessert cartons < 1 ltr	386	1,2%	56,7%
Juice cartons ≥ 1 ltr	5159	15,6%	32,0%
Juice cartons < 1 ltr	333	1,0%	45,5%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	1603	4,9%	51,1%
Cartons with fresh mixes of juice & dairy < 1 ltr	0	0,0%	0,0%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	366	1,1%	43,1%
Cartons with UHT mixes of juice & dairy < 1 ltr	27	0,1%	38,5%
Residual cartons ≥ 1 ltr	1227	3,7%	31,1%
Residual cartons < 1 ltr	896	2,7%	30,2%
Paper & board	914	2,8%	
Plastics	398	1,2%	
Organic waste and indefinable waste	66	0,2%	
Textile	0	0,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	14	0,0%	
Glass	0	0,0%	
Total	33018	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
36,6	26,6	10,0
25,0	17,2	7,8
46,0	29,5	16,5
18,7	8,0	10,7
56,7	27,6	29,1
40,3	17,4	22,9
61,0	41,5	19,5
19,1	10,4	8,7
57,7	28,2	29,5
50,4	28,7	21,7
13,0	8,0	5,0
45,7	31,5	14,2
23,2	16,2	7,0

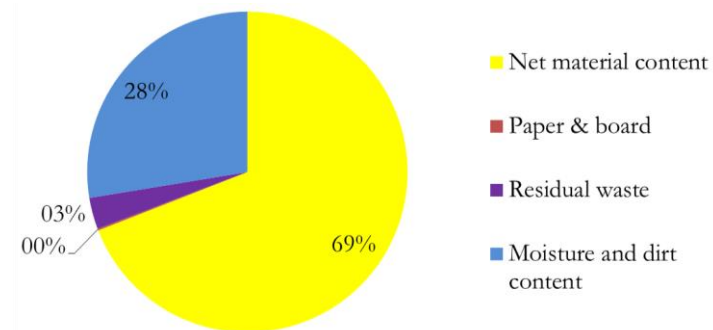


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Municipality	Stadskanaal	Date of sampling	24-10-2013
Volume of sample	1 m ³ bigbag	Density of sample	41 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%] ¹	Moisture and dirt content [%] ²
Milk cartons ≥ 1 ltr	4499	10,9%	27,3%
Milk cartons < 1 ltr	0	0,0%	0,0%
UHT milk cartons ≥ 1 ltr	7342	17,8%	23,3%
UHT milk cartons < 1 ltr	473	1,1%	30,0%
Yoghurt & dessert cartons ≥ 1 ltr	12330	29,9%	22,6%
Yoghurt & dessert cartons < 1 ltr	493	1,2%	70,1%
Juice cartons ≥ 1 ltr	7253	17,6%	26,7%
Juice cartons < 1 ltr	518	1,3%	22,9%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	1937	4,7%	59,3%
Cartons with fresh mixes of juice & dairy < 1 ltr	22	0,1%	28,6%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	2257	5,5%	47,5%
Cartons with UHT mixes of juice & dairy < 1 ltr	417	1,0%	28,7%
Residual cartons ≥ 1 ltr	571	1,4%	34,1%
Residual cartons < 1 ltr	1761	4,3%	32,1%
Paper & board	66	0,2%	
Plastics	58	0,1%	
Organic waste and indefinable waste	1251	3,0%	
Textile	2	0,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	3	0,0%	
Glass	0	0,0%	
Total	41253	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
38,4	27,9	10,5
37,3	28,6	8,7
12,0	8,4	3,6
34,5	26,7	7,8
61,5	18,4	43,1
49,8	36,5	13,3
10,9	8,4	2,5
69,5	28,3	41,2
21,0	15,0	6,0
57,3	30,1	27,2
11,5	8,2	3,3
47,5	31,3	16,2
24,6	16,7	7,9

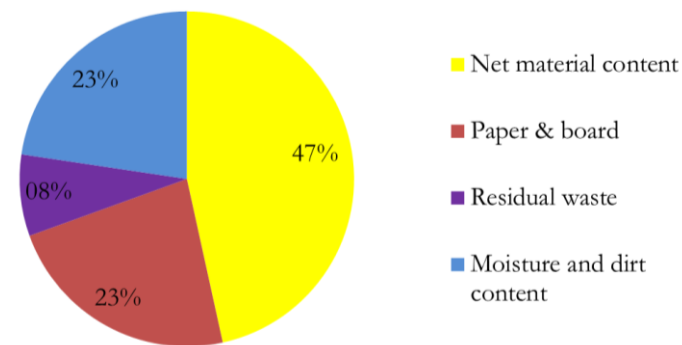


Notes	Plastic collection bags: 58 kg, included in plastic amount
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Municipality	Tilburg	Date of sampling	10-10-2013
Volume of sample	1 m ³ bigbag	Density of sample	53 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	8351	15,8%	25,3%
Milk cartons < 1 ltr	149	0,3%	20,4%
UHT milk cartons ≥ 1 ltr	4784	9,0%	24,4%
UHT milk cartons < 1 ltr	188	0,4%	24,1%
Yoghurt & dessert cartons ≥ 1 ltr	9448	17,9%	49,5%
Yoghurt & dessert cartons < 1 ltr	380	0,7%	54,0%
Juice cartons ≥ 1 ltr	7942	15,0%	25,6%
Juice cartons < 1 ltr	358	0,7%	15,1%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	1684	3,2%	41,8%
Cartons with fresh mixes of juice & dairy < 1 ltr	228	0,4%	52,7%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	748	1,4%	44,6%
Cartons with UHT mixes of juice & dairy < 1 ltr	44	0,1%	25,0%
Residual cartons ≥ 1 ltr	1485	2,8%	19,3%
Residual cartons < 1 ltr	796	1,5%	25,0%
Paper & board	12128	22,9%	
Plastics	2762	5,2%	
Organic waste and indefinable waste	76	0,1%	
Textile	1057	2,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	27	0,1%	
Glass	234	0,4%	
Total	52869	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
37,5	28,0	9,5
21,0	16,7	4,3
41,9	31,7	10,2
10,8	8,2	2,6
54,8	27,7	27,1
35,2	16,2	19,0
57,9	43,1	14,8
9,3	7,9	1,4
47,8	27,8	20,0
37,7	17,8	19,8
55,2	30,6	24,6
11,0	8,3	2,8
41,4	33,4	8,0
21,2	15,9	5,3

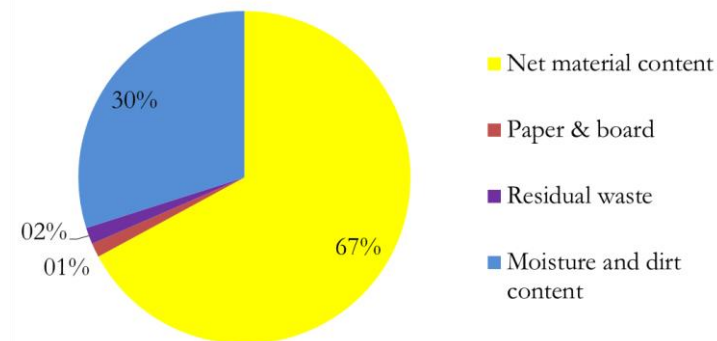


Notes	Relatively big amount of paper and board
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Municipality	Voorst	Date of sampling	24-10-2013
Volume of sample	1 m ³ bigbag	Density of sample	30 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%] ¹	Moisture and dirt content [%] ²
Milk cartons ≥ 1 ltr	14653	24,5%	23,5%
Milk cartons < 1 ltr	211	0,4%	29,0%
UHT milk cartons ≥ 1 ltr	5342	8,9%	31,4%
UHT milk cartons < 1 ltr	102	0,2%	27,7%
Yoghurt & dessert cartons ≥ 1 ltr	13258	22,1%	46,5%
Yoghurt & dessert cartons < 1 ltr	109	0,2%	60,2%
Juice cartons ≥ 1 ltr	14312	23,9%	22,7%
Juice cartons < 1 ltr	647	1,1%	18,1%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	4061	6,8%	31,9%
Cartons with fresh mixes of juice & dairy < 1 ltr	107	0,2%	24,5%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	2532	4,2%	41,4%
Cartons with UHT mixes of juice & dairy < 1 ltr	44	0,1%	21,4%
Residual cartons ≥ 1 ltr	1338	2,2%	25,6%
Residual cartons < 1 ltr	1408	2,4%	28,3%
Paper & board	816	1,4%	
Plastics	263	0,4%	
Organic waste and indefinable waste	687	1,1%	
Textile	0	0,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	15	0,0%	
Glass	0	0,0%	
Total	59905	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
35,7	27,3	8,4
23,3	16,6	6,8
43,7	30,0	13,7
11,2	8,1	3,1
51,0	27,3	23,7
54,0	21,5	32,5
51,6	39,9	11,7
10,5	8,6	1,9
39,8	27,1	12,7
21,2	16,0	5,2
50,3	29,5	20,8
10,5	8,3	2,3
43,4	32,3	11,1
21,9	15,7	6,2

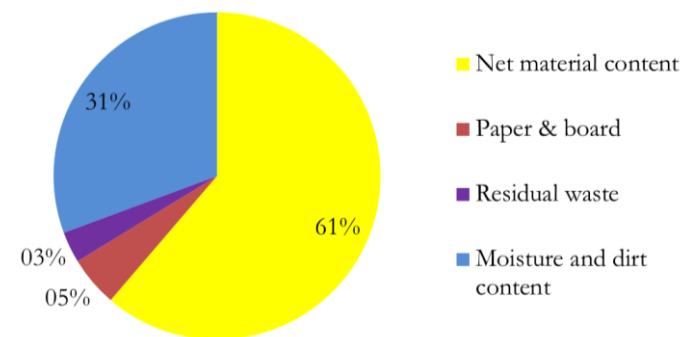


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Municipality	Zoetermeer	Date of sampling	19-09-2013
Volume of sample	1 m ³ bigbag	Density of sample	39 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	10107	25,7%	26,5%
Milk cartons < 1 ltr	250	0,6%	42,6%
UHT milk cartons ≥ 1 ltr	1765	4,5%	27,7%
UHT milk cartons < 1 ltr	75	0,2%	33,8%
Yoghurt & dessert cartons ≥ 1 ltr	5916	15,0%	57,5%
Yoghurt & dessert cartons < 1 ltr	144	0,4%	24,8%
Juice cartons ≥ 1 ltr	11826	30,0%	27,4%
Juice cartons < 1 ltr	160	0,4%	25,7%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	2721	6,9%	43,6%
Cartons with fresh mixes of juice & dairy < 1 ltr	212	0,5%	45,9%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	216	0,5%	24,5%
Cartons with UHT mixes of juice & dairy < 1 ltr	13	0,0%	25,0%
Residual cartons ≥ 1 ltr	2318	5,9%	25,5%
Residual cartons < 1 ltr	486	1,2%	26,0%
Paper & board	1966	5,0%	
Plastics	1087	2,8%	
Organic waste and indefinable waste	66	0,2%	
Textile	0	0,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	0	0,0%	
Glass	61	0,2%	
Total	39389	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
35,9	26,4	9,5
27,7	15,9	11,8
40,8	29,5	11,3
14,8	9,8	5,0
63,0	26,8	36,2
20,1	15,1	5,0
53,6	38,9	14,7
10,9	8,1	2,8
53,2	30,0	23,2
32,7	17,7	15,0
40,8	30,8	10,0
12,0	9,0	3,0
39,6	29,5	10,1
20,0	14,8	5,2

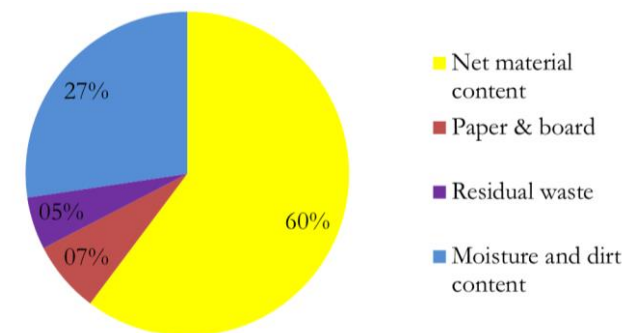


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Municipality	Zutphen	Date of sampling	26-06-2013
Volume of sample	1 m ³ bigbag	Density of sample	31 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%] ¹	Moisture and dirt content [%] ²
Milk cartons ≥ 1 ltr	7311	23,7%	28,3%
Milk cartons < 1 ltr	219	0,7%	18,6%
UHT milk cartons ≥ 1 ltr	2060	6,7%	25,9%
UHT milk cartons < 1 ltr	38	0,1%	23,6%
Yoghurt & dessert cartons ≥ 1 ltr	4181	13,6%	57,9%
Yoghurt & dessert cartons < 1 ltr	290	0,9%	39,5%
Juice cartons ≥ 1 ltr	8316	27,0%	20,3%
Juice cartons < 1 ltr	83	0,3%	24,5%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	2072	6,7%	43,6%
Cartons with fresh mixes of juice & dairy < 1 ltr	68	0,2%	53,3%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	510	1,7%	30,5%
Cartons with UHT mixes of juice & dairy < 1 ltr	13	0,0%	30,8%
Residual cartons ≥ 1 ltr	1527	5,0%	24,6%
Residual cartons < 1 ltr	282	0,9%	17,0%
Paper & board	2208	7,2%	
Plastics	651	2,1%	
Organic waste and indefinable waste	945	3,1%	
Textile	17	0,1%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	0	0,0%	
Glass	0	0,0%	
Total	30791	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
39,6	28,4	11,2
22,6	18,4	4,2
40,2	29,8	10,4
11,0	8,4	2,6
68,4	28,8	39,6
33,2	20,1	13,1
53,1	42,3	10,8
11,8	8,9	2,9
54,1	30,5	23,6
37,5	17,5	20,0
45,3	31,5	13,8
13,0	9,0	4,0
47,5	35,8	11,7
19,4	16,1	3,3



Notes	-
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B Sorting results per municipality – collection with plastic as carrier

List of municipalities:

- Almere
- Binnenmaas
- De ronde venen
- Deventer
- Geldrop-Mierlo
- Nijmegen
- Schiedam
- Steenwijkerland
- Vught
- Zeist

Municipalities with ‘milieuzakken’:

- Marum, Grootegast and Leek

¹ Gross material content [%] calculated based on total weight of sample

² Moisture and dirt content [%] calculated per category

³ Net material content [%] calculated based on total weight of sample

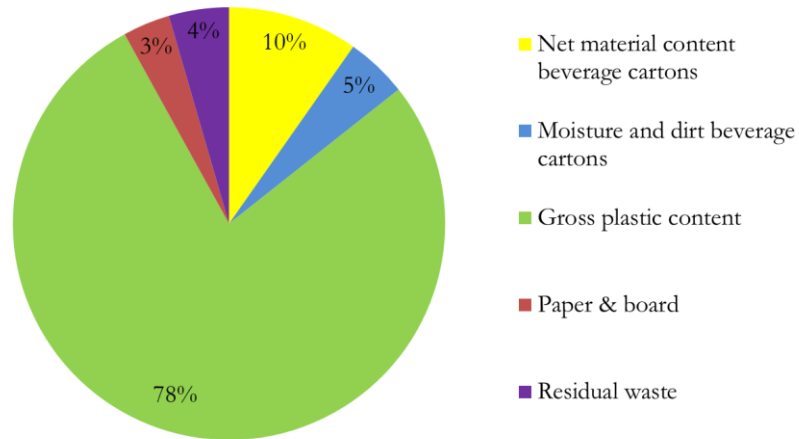
⁴ Moisture and dirt content [%] calculated based on total weight of sample

Municipality	Almere	Date of sampling	18-10-2013
Volume of sample	2 × 1 m ³ bigbag	Density of sample	39 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	1412	1,8%	25,9%
Milk cartons < 1 ltr	49	0,1%	30,6%
UHT milk cartons ≥ 1 ltr	1061	1,4%	31,3%
UHT milk cartons < 1 ltr	34	0,0%	26,5%
Yoghurt & dessert cartons ≥ 1 ltr	1908	2,4%	62,9%
Yoghurt & dessert cartons < 1 ltr	54	0,1%	37,0%
Juice cartons ≥ 1 ltr	3607	4,6%	19,2%
Juice cartons < 1 ltr	887	1,1%	23,8%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	1326	1,7%	36,8%
Cartons with fresh mixes of juice & dairy < 1 ltr	112	0,1%	33,3%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	135	0,2%	34,1%
Cartons with UHT mixes of juice & dairy < 1 ltr	0	0,0%	0,0%
Residual cartons ≥ 1 ltr	418	0,5%	28,5%
Residual cartons < 1 ltr	250	0,3%	29,6%
Paper & board	2770	3,5%	
Plastics*	60832	77,6%	
Organic waste and indefinable waste	1626	2,1%	
Textile	812	1,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	1054	1,3%	
Glass	30	0,0%	
Total	78377	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
42,8	31,7	11,1
24,5	17,0	7,5
42,5	29,2	13,3
11,3	8,3	3,0
74,7	27,7	47,0
27,0	17,0	10,0
53,1	42,9	10,2
10,1	7,7	2,4
49,2	31,1	18,1
27,8	18,5	9,3
45,0	29,7	15,3
46,3	33,1	13,2
19,9	14,0	5,9

	Gross material content [%]	Net material content [%] ³	Moisture and dirt content [%] ⁴
Beverage	14,4%	9,8%	4,6%
Plastic	77,6%		
Residual waste	8,0%		



Notes	-
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***Further breakdown plastic fraction**
(Percentages based on the plastic weight)

	PET	PE	PP	PVC	PS	Total
Bottles	3,2%	3,8%	0,0%	0,0%	0,1%	7,1%
Flasks	2,8%	6,0%	3,0%	0,1%		11,9%
Rigids	11,0%	0,6%	8,1%	1,0%	2,3%	23,0%
Flexibles	0,2%	23,1%	5,1%	0,5%	0,0%	28,8%
Laminated flexibles	0,6%	3,5%	0,7%	0,0%	0,0%	4,7%
Non-packaging plastics	0,0%	1,9%	6,0%	3,3%	1,9%	13,2%
Undesired plastic packaging	0,0%	0,0%	0,0%	0,0%	0,1%	0,1%
Residual plastics						11,1%
Total	17,8%	38,9%	22,9%	4,9%	4,5%	100%

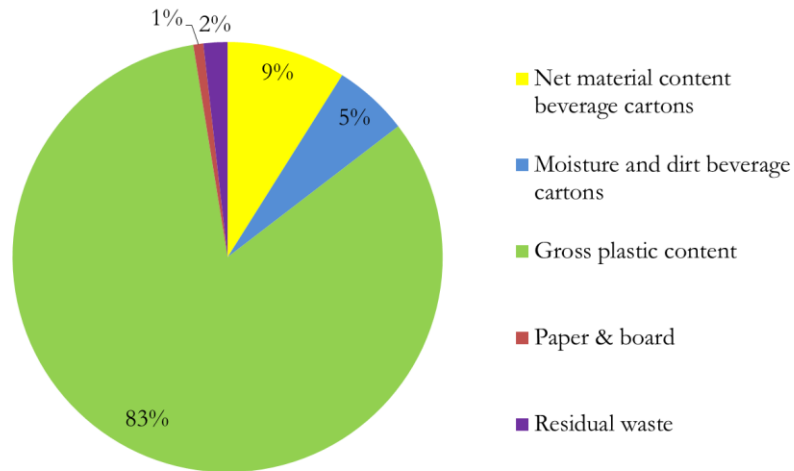
	Moisture and dirt content [%] ²
PET bottles transparent < 0,5 ltr	29,4%
PE flasks	22,4%
PP Rigids	24,5%
PET Rigids	4,2%
PE Flexibles > A4	14,4%

Municipality	Binnenmaas	Date of sampling	18-10-2013
Volume of sample	2 × 1 m ³ bigbag	Density of sample	28 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	2470	4,4%	35,0%
Milk cartons < 1 ltr	45	0,1%	24,4%
UHT milk cartons ≥ 1 ltr	691	1,2%	33,2%
UHT milk cartons < 1 ltr	122	0,2%	55,0%
Yoghurt & dessert cartons ≥ 1 ltr	2159	3,8%	57,8%
Yoghurt & dessert cartons < 1 ltr	0	0,0%	0,0%
Juice cartons ≥ 1 ltr	916	1,6%	24,4%
Juice cartons < 1 ltr	173	0,3%	29,7%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	607	1,1%	43,5%
Cartons with fresh mixes of juice & dairy < 1 ltr	48	0,1%	27,1%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	0	0,0%	0,0%
Cartons with UHT mixes of juice & dairy < 1 ltr	36	0,1%	28,6%
Residual cartons ≥ 1 ltr	744	1,3%	19,8%
Residual cartons < 1 ltr	178	0,3%	22,5%
Paper & board	422	0,8%	
Plastics*	46493	82,9%	
Organic waste and indefinable waste	673	1,2%	
Textile	0	0,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	340	0,6%	
Glass	0	0,0%	
Total	56117	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
40,9	26,6	14,3
22,5	17,0	5,5
44,3	29,6	14,7
20,0	9,0	11,0
66,1	27,9	38,2
51,3	38,8	12,5
11,8	8,3	3,5
50,4	28,5	21,9
24,0	17,5	6,5
11,7	8,3	3,3
71,1	57,0	14,1
29,7	23,0	6,7

	Gross material content [%]	Net material content [%] ³	Moisture and dirt content [%] ⁴
Beverage	14,6%	8,9%	5,6%
Plastic	82,9%		
Residual waste	2,6%		



Notes	-
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***Further breakdown plastic fraction**
(Percentages based on the plastic weight)

	PET	PE	PP	PVC	PS	Total
Bottles	11,8%	0,7%	0,2%	0,0%	0,1%	12,7%
Flasks	6,7%	12,0%	2,5%	0,0%		21,2%
Rigids	16,7%	0,5%	8,2%	0,6%	2,4%	28,5%
Flexibles	0,1%	19,2%	4,3%	0,2%	0,0%	23,9%
Laminated flexibles	0,2%	3,2%	0,2%	0,0%	0,0%	3,6%
Non-packaging plastics	0,4%	1,0%	2,1%	0,4%	0,6%	4,5%
Undesired plastic packaging	0,0%	0,0%	0,0%	0,0%	0,1%	0,1%
Residual plastics						5,5%
Total	36,0%	36,6%	17,5%	1,3%	3,2%	100%

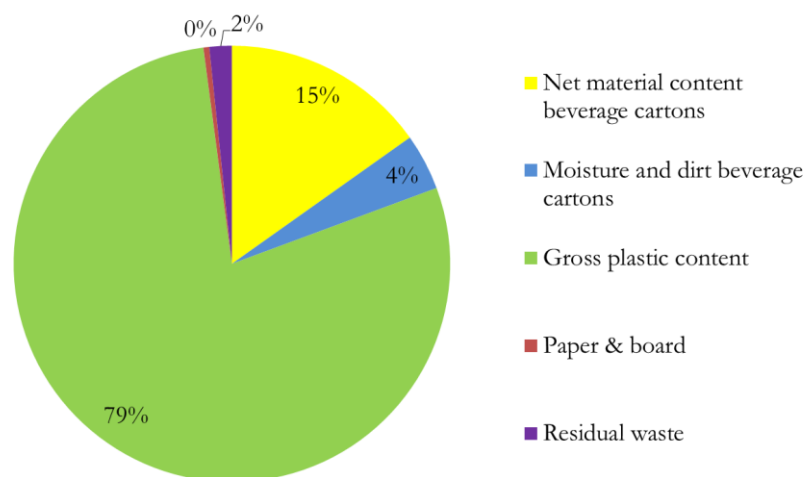
	Moisture and dirt content [%] ²
PET bottles transparent < 0,5 ltr	10%
PE flasks	20%
PP Rigids	5%
PET Rigids	13%
PE Flexibles > A4	4%

Municipality	De ronde venen	Date of sampling	13-06-2013
Volume of sample	2 × 1 m ³ bigbag	Density of sample	52 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%] ¹	Moisture and dirt content [%] ²
Milk cartons ≥ 1 ltr	4235	4,1%	20,5%
Milk cartons < 1 ltr	63	0,1%	11,1%
UHT milk cartons ≥ 1 ltr	1880	1,8%	17,1%
UHT milk cartons < 1 ltr	19	0,0%	11,1%
Yoghurt & dessert cartons ≥ 1 ltr	2721	2,6%	38,4%
Yoghurt & dessert cartons < 1 ltr	105	0,1%	21,0%
Juice cartons ≥ 1 ltr	8126	7,8%	15,6%
Juice cartons < 1 ltr	215	0,2%	17,2%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	1485	1,4%	34,6%
Cartons with fresh mixes of juice & dairy < 1 ltr	0	0,0%	0,0%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	309	0,3%	22,6%
Cartons with UHT mixes of juice & dairy < 1 ltr	22	0,0%	18,2%
Residual cartons ≥ 1 ltr	399	0,4%	14,0%
Residual cartons < 1 ltr	513	0,5%	24,6%
Paper & board	449	0,4%	
Plastics*	81548	78,6%	
Organic waste and indefinable waste	1547	1,5%	
Textile	54	0,1%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	120	0,1%	
Glass	0	0,0%	
Total	103810	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
40,0	31,8	8,2
21,0	18,7	2,3
35,1	29,1	6,0
9,0	8,0	1,0
49,2	30,3	18,9
21,0	16,6	4,4
51,3	43,3	8,0
11,6	9,6	2,0
48,5	31,7	16,8
38,8	30,0	8,8
11,0	9,0	2,0
43,7	37,6	6,1
22,4	16,9	5,5

	Gross material content [%]	Net material content [%] ³	Moisture and dirt content [%] ⁴
Beverage	19,4%	15,2%	4,2%
Plastic	78,6%		
Residual waste	2,1%		



Notes	-
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***Further breakdown plastic fraction**
(Percentages based on the plastic weight)

	PET	PE	PP	PVC	PS	Total
Bottles	5,7%	2,7%	0,0%	0,0%	0,1%	8,5%
Flasks	3,6%	6,5%	0,7%	0,1%		11,0%
Rigids	17,6%	2,2%	10,9%	1,2%	2,5%	34,4%
Flexibles	0,1%	18,9%	3,8%	0,3%	0,1%	23,2%
Laminated flexibles	0,3%	2,1%	0,3%	0,0%	0,0%	2,7%
Non-packaging plastics	0,0%	1,3%	3,9%	0,5%	0,7%	6,5%
Undesired plastic packaging	0,0%	0,0%	0,0%	0,0%	0,1%	0,1%
Residual plastics						13,6%
Total	27,3%	33,7%	19,7%	2,1%	3,6%	100%

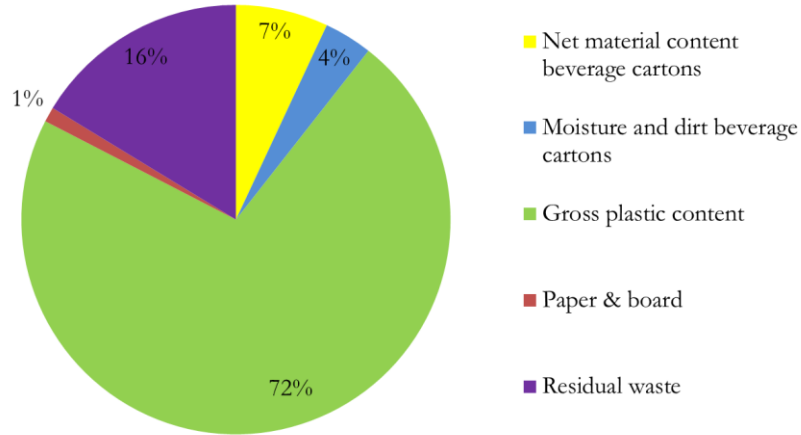
	Moisture and dirt content [%] ²
PET bottles transparent < 0,5 ltr	4,7%
PE flasks	3,8%
PP Rigids	3,3%
PET Rigids	4,8%
PE Flexibles > A4	7,0%

Municipality	Deventer	Date of sampling	18-10-2013
Volume of sample	2 × 1 m ³ bigbag	Density of sample	40 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	1770	2,2%	31,2%
Milk cartons < 1 ltr	0	0,0%	0,0%
UHT milk cartons ≥ 1 ltr	402	0,5%	27,9%
UHT milk cartons < 1 ltr	437	0,5%	35,3%
Yoghurt & dessert cartons ≥ 1 ltr	3190	4,0%	40,4%
Yoghurt & dessert cartons < 1 ltr	139	0,2%	40,3%
Juice cartons ≥ 1 ltr	1259	1,6%	23,2%
Juice cartons < 1 ltr	97	0,1%	25,8%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	414	0,5%	37,2%
Cartons with fresh mixes of juice & dairy < 1 ltr	65	0,1%	38,1%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	111	0,1%	45,0%
Cartons with UHT mixes of juice & dairy < 1 ltr	11	0,0%	25,0%
Residual cartons ≥ 1 ltr	258	0,3%	31,0%
Residual cartons < 1 ltr	326	0,4%	35,7%
Paper & board	899	1,1%	
Plastics*	57594	72,0%	
Organic waste and indefinable waste	8826	11,0%	
Textile	979	1,2%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	2966	3,7%	
Glass	267	0,3%	
Total	80010	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
39,8	27,4	12,4
40,1	28,9	11,2
13,3	8,6	4,7
46,8	27,9	18,9
34,8	20,8	14,0
50,4	38,7	11,7
16,2	12,0	4,2
46,0	28,9	17,1
15,8	9,8	6,0
54,5	30,0	24,5
12,0	9,0	3,0
43,0	29,7	13,3
23,0	14,8	8,2

	Gross material content [%]	Net material content [%] ³	Moisture and dirt content [%] ⁴
Beverage	10,6%	7,0%	3,6%
Plastic	72,0%		
Residual waste	17,4%		



Notes	-
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***Further breakdown plastic fraction**
(Percentages based on the plastic weight)

	PET	PE	PP	PVC	PS	Total
Bottles	3,3%	3,3%	0,0%	0,0%	0,0%	6,6%
Flasks	1,8%	3,8%	1,5%	0,0%		7,2%
Rigids	8,7%	1,2%	7,7%	0,3%	1,5%	19,4%
Flexibles	0,1%	19,9%	4,4%	0,2%	0,0%	24,6%
Laminated flexibles	0,2%	2,3%	0,7%	0,0%	0,0%	3,1%
Non-packaging plastics	0,8%	19,7%	2,0%	1,0%	1,6%	25,2%
Undesired plastic packaging	0,0%	0,2%	0,0%	0,1%	0,1%	0,5%
Residual plastics						13,4%
Total	14,8%	50,5%	16,3%	1,6%	3,2%	100%

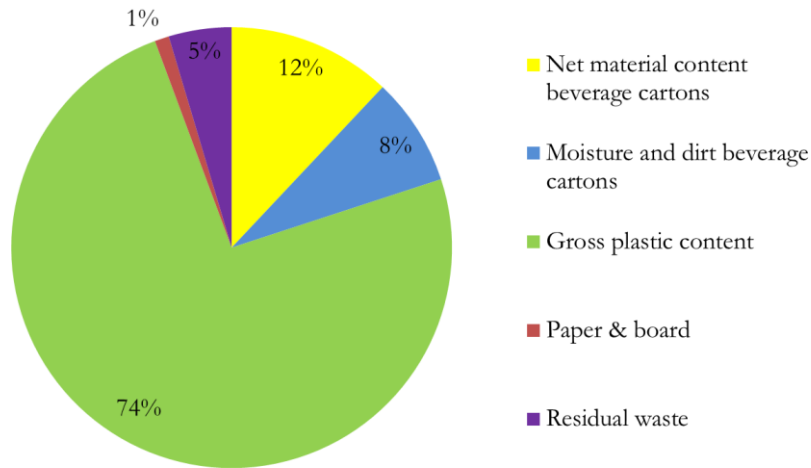
	Moisture and dirt content [%] ²
PET bottles transparent < 0,5 ltr	13,3%
PE flasks	13,0%
PP Rigids	18,2%
PET Rigids	8,2%
PE Flexibles > A4	35,3%

Municipality	Geldrop-mierlo	Date of sampling	16-10-2013
Volume of sample	2 × 1 m ³ bigbag	Density of sample	32 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	1867	2,9%	29,4%
Milk cartons < 1 ltr	19	0,0%	15,8%
UHT milk cartons ≥ 1 ltr	1463	2,3%	25,4%
UHT milk cartons < 1 ltr	52	0,1%	19,2%
Yoghurt & dessert cartons ≥ 1 ltr	4232	6,5%	58,6%
Yoghurt & dessert cartons < 1 ltr	154	0,2%	65,6%
Juice cartons ≥ 1 ltr	3176	4,9%	25,3%
Juice cartons < 1 ltr	205	0,3%	22,9%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	1186	1,8%	52,6%
Cartons with fresh mixes of juice & dairy < 1 ltr	0	0,0%	0,0%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	393	0,6%	29,3%
Cartons with UHT mixes of juice & dairy < 1 ltr	0	0,0%	0,0%
Residual cartons ≥ 1 ltr	100	0,2%	22,0%
Residual cartons < 1 ltr	104	0,2%	30,8%
Paper & board	679	1,0%	
Plastics*	48209	74,4%	
Organic waste and indefinable waste	2259	3,5%	
Textile	11	0,0%	
Metals < 100 gram	422	0,7%	
Metals ≥ 100 gram	299	0,5%	
Glass	0	0,0%	
Total	64830	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
36,7	25,9	10,8
19,0	16,0	3,0
40,5	30,2	10,3
10,4	8,4	2,0
67,6	28,0	39,6
51,3	17,7	33,7
53,7	40,1	13,6
10,9	8,4	2,5
63,9	30,3	33,6
41,8	29,5	12,3
50,0	39,0	11,0
26,0	18,0	8,0

	Gross material content [%]	Net material content [%] ³	Moisture and dirt content [%] ⁴
Beverage	20,0%	12,0%	8,0%
Plastic	74,4%		
Residual waste	5,7%		



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***Further breakdown plastic fraction**
(Percentages based on the plastic weight)

	PET	PE	PP	PVC	PS	Total
Bottles	6,3%	1,8%	0,9%	0,0%	0,2%	9,2%
Flasks	5,8%	10,5%	3,6%	0,0%		20,0%
Rigids	15,2%	1,2%	12,5%	0,6%	3,7%	33,2%
Flexibles	0,1%	17,5%	4,7%	0,2%	0,0%	22,5%
Laminated flexibles	0,2%	4,4%	1,0%	0,0%	0,0%	5,7%
Non-packaging plastics	0,6%	0,5%	2,4%	0,4%	1,8%	5,7%
Undesired plastic packaging	0,0%	0,3%	0,0%	0,3%	0,1%	0,6%
Residual plastics						3,1%
Total	28,3%	36,2%	25,3%	1,4%	5,7%	100%

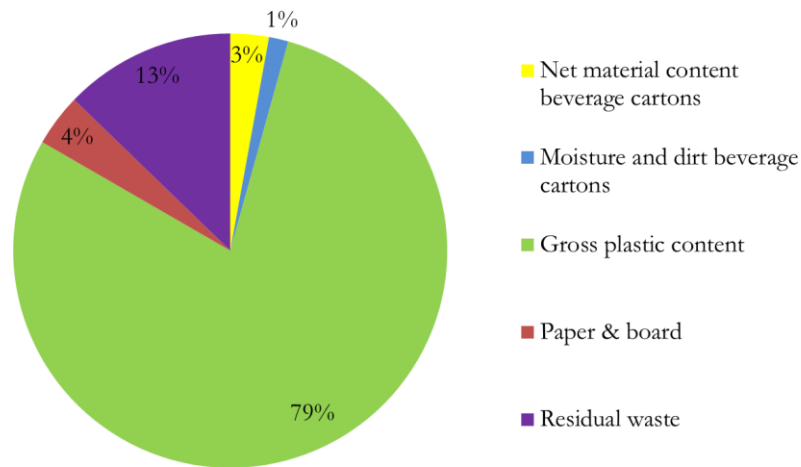
	Moisture and dirt content [%] ²
PET bottles transparent < 0,5 ltr	12,1%
PE flasks	15,5%
PP Rigids	5,8%
PET Rigids	14,0%
PE Flexibles > A4	12,2%

Municipality	Nijmegen	Date of sampling	23-08-2013
Volume of sample	2 × 1 m ³ bigbag	Density of sample	30 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	407	0,7%	21,2%
Milk cartons < 1 ltr	0	0,0%	0,0%
UHT milk cartons ≥ 1 ltr	115	0,2%	24,1%
UHT milk cartons < 1 ltr	0	0,0%	0,0%
Yoghurt & dessert cartons ≥ 1 ltr	641	1,1%	55,1%
Yoghurt & dessert cartons < 1 ltr	0	0,0%	0,0%
Juice cartons ≥ 1 ltr	978	1,7%	26,0%
Juice cartons < 1 ltr	53	0,1%	19,2%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	0	0,0%	0,0%
Cartons with fresh mixes of juice & dairy < 1 ltr	0	0,0%	0,0%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	75	0,1%	17,6%
Cartons with UHT mixes of juice & dairy < 1 ltr	112	0,2%	30,6%
Residual cartons ≥ 1 ltr	127	0,2%	52,9%
Residual cartons < 1 ltr	36	0,1%	14,1%
Paper & board	2303	3,9%	
Plastics*	46625	79,0%	
Organic waste and indefinable waste	2669	4,5%	
Textile	3041	5,2%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	1068	1,8%	
Glass	756	1,3%	
Total	59006	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
34,0	26,8	7,2
38,7	29,3	9,3
60,2	27,0	33,2
55,0	40,7	14,3
10,4	8,4	2,0
37,0	30,5	6,5
12,0	8,3	3,7
34,0	16,0	18,0
32,0	27,5	4,5

	Gross material content [%]	Net material content [%] ³	Moisture and dirt content [%] ⁴
Beverage	4,3%	2,9%	1,4%
Plastic	79,0%		
Residual waste	16,7%		



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***Further breakdown plastic fraction**
(Percentages based on the plastic weight)

	PET	PE	PP	PVC	PS	Total
Bottles	7,2%	3,3%	0,0%	0,0%	0,0%	10,5%
Flasks	5,2%	5,7%	2,8%	0,0%		13,6%
Rigids	16,2%	2,0%	11,0%	0,7%	3,6%	33,5%
Flexibles	0,1%	20,7%	4,9%	0,1%	0,0%	25,9%
Laminated flexibles	0,3%	3,1%	0,7%	0,0%	0,0%	4,1%
Non-packaging plastics	3,5%	3,8%	0,0%	0,5%	0,4%	8,2%
Undesired plastic packaging	0,0%	0,0%	0,0%	0,1%	0,2%	0,3%
Residual plastics						3,8%
Total	32,4%	38,7%	19,4%	1,3%	4,3%	100%

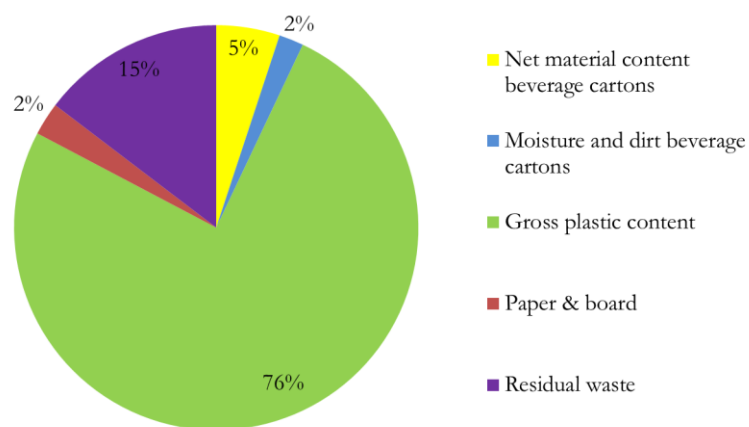
	Moisture and dirt content [%] ²
PET bottles transparent < 0,5 ltr	2,0%
PE flasks	10,5%
PP Rigids	7,4%
PET Rigids	1,6%
PE Flexibles > A4	1,5%

Municipality	Nijmegen	Date of sampling	15-11-2013
Volume of sample	2 × 1 m ³ bigbag	Density of sample	41 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	935	1,1%	28,4%
Milk cartons < 1 ltr	22	0,0%	14,3%
UHT milk cartons ≥ 1 ltr	935	1,1%	25,7%
UHT milk cartons < 1 ltr	26	0,0%	32,0%
Yoghurt & dessert cartons ≥ 1 ltr	804	1,0%	36,0%
Yoghurt & dessert cartons < 1 ltr	37	0,0%	55,6%
Juice cartons ≥ 1 ltr	1895	2,3%	22,5%
Juice cartons < 1 ltr	99	0,1%	25,3%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	367	0,4%	35,4%
Cartons with fresh mixes of juice & dairy < 1 ltr	27	0,0%	33,3%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	0	0,0%	0,0%
Cartons with UHT mixes of juice & dairy < 1 ltr	0	0,0%	0,0%
Residual cartons ≥ 1 ltr	507	0,6%	33,5%
Residual cartons < 1 ltr	122	0,1%	23,6%
Paper & board	2159	2,6%	
Plastics*	61984	75,7%	
Organic waste and indefinable waste	5758	7,0%	
Textile	630	0,8%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	5268	6,4%	
Glass	353	0,4%	
Total	81928	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
39,5	28,3	11,2
21,0	18,0	3,0
38,5	28,6	9,9
12,5	8,5	4,0
43,3	27,7	15,6
36,0	16,0	20,0
51,5	39,9	11,6
12,4	9,3	3,1
44,9	29,0	15,9
27,0	18,0	9,0
44,5	29,6	14,9
24,6	18,8	5,8

	Gross material content [%]	Net material content [%] ³	Moisture and dirt content [%] ⁴
Beverage	7,1%	5,1%	2,0%
Plastic	75,7%		
Residual waste	17,3%		



Notes	Extra measurement, not included in calculations
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***Further breakdown plastic fraction**
(Percentages based on the plastic weight)

	PET	PE	PP	PVC	PS	Total
Bottles	5,1%	2,7%	0,1%	0,0%	0,1%	7,9%
Flasks	3,5%	9,6%	0,7%	0,0%		13,8%
Rigids	15,9%	1,2%	8,8%	0,7%	3,4%	30,1%
Flexibles	0,2%	19,1%	4,6%	0,3%	0,0%	24,1%
Laminated flexibles	0,3%	3,8%	0,9%	0,0%	0,0%	5,0%
Non-packaging plastics	0,2%	5,6%	3,0%	1,6%	1,2%	11,7%
Undesired plastic packaging	0,0%	0,0%	0,0%	0,1%	0,1%	0,2%
Residual plastics						7,1%
Total	25,2%	41,9%	18,1%	2,7%	4,9%	100%

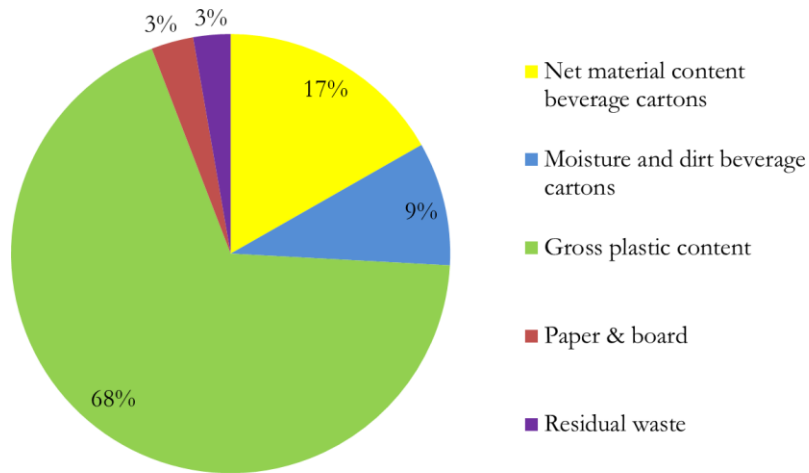
	Moisture and dirt content [%] ²
PET bottles transparent < 0,5 ltr	19,1%
PE flasks	14,6%
PP Rigids	16,1%
PET Rigids	2,9%
PE Flexibles > A4	19,5%

Municipality	Schiedam	Date of sampling	23-09-2013
Volume of sample	2 × 1 m ³ bigbag	Density of sample	24 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	2278	4,8%	29,6%
Milk cartons < 1 ltr	63	0,1%	19,0%
UHT milk cartons ≥ 1 ltr	1006	2,1%	18,2%
UHT milk cartons < 1 ltr	110	0,2%	39,1%
Yoghurt & dessert cartons ≥ 1 ltr	3012	6,4%	66,8%
Yoghurt & dessert cartons < 1 ltr	181	0,4%	27,8%
Juice cartons ≥ 1 ltr	2855	6,1%	19,7%
Juice cartons < 1 ltr	95	0,2%	14,9%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	928	2,0%	45,1%
Cartons with fresh mixes of juice & dairy < 1 ltr	58	0,1%	0,0%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	0	0,0%	0,0%
Cartons with UHT mixes of juice & dairy < 1 ltr	33	0,1%	23,5%
Residual cartons ≥ 1 ltr	1264	2,7%	15,8%
Residual cartons < 1 ltr	272	0,6%	36,3%
Paper & board	1461	3,1%	
Plastics*	32113	68,3%	
Organic waste and indefinable waste	373	0,8%	
Textile	5	0,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	910	1,9%	
Glass	0	0,0%	
Total	47017		

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
41,2	29,0	12,2
21,0	17,0	4,0
35,2	28,8	6,4
13,8	8,4	5,4
86,4	28,7	57,7
20,0	14,4	5,6
48,7	39,1	9,6
10,4	8,9	1,6
52,2	28,7	23,6
UNKNOWN		
11,3	8,7	2,7
44,3	37,3	7,0
24,5	15,6	8,9

	Gross material content [%]	Net material content [%] ³	Moisture and dirt content [%] ⁴
Beverage	25,9%	16,8%	9,1%
Plastic	68,3%		
Residual waste	5,8%		



Notes	-
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***Further breakdown plastic fraction**
(Percentages based on the plastic weight)

	PET	PE	PP	PVC	PS	Total
Bottles	9,0%	4,3%	0,0%	0,0%	0,2%	13,5%
Flasks	7,1%	9,1%	2,3%	0,0%		18,4%
Rigids	12,4%	1,2%	9,4%	0,4%	2,1%	25,5%
Flexibles	0,0%	23,1%	3,0%	0,2%	0,0%	26,3%
Laminated flexibles	0,4%	1,7%	0,6%	0,0%	0,0%	2,7%
Non-packaging plastics	0,1%	0,7%	0,7%	4,3%	2,1%	7,9%
Undesired plastic packaging	0,0%	0,0%	0,0%	0,3%	0,0%	0,4%
Residual plastics						5,3%
Total	29,0%	40,1%	15,9%	5,2%	4,5%	100%

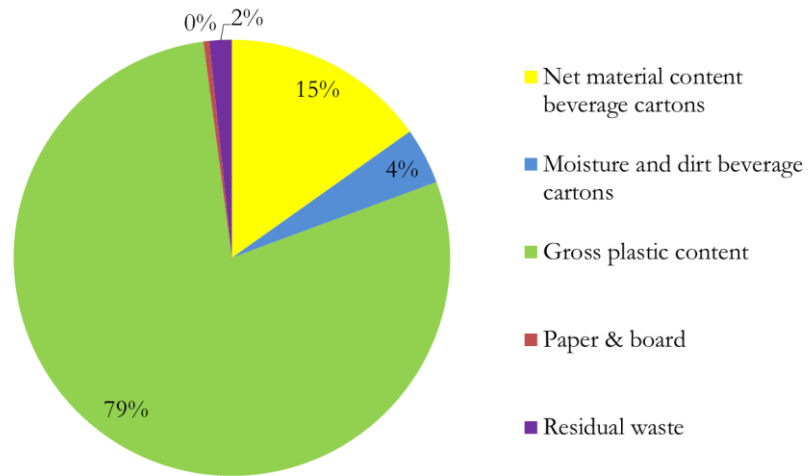
	Moisture and dirt content [%] ²
PET bottles transparent < 0,5 ltr	7,52%
PE flasks	19,92%
PP Rigids	32,16%
PET Rigids	11,64%
PE Flexibles > A4	1,64%

Municipality	Steenwijkerland	Date of sampling	02-10-2013
Volume of sample	2 × 1 m ³ bigbag	Density of sample	32 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	1790	2,8%	22,0%
Milk cartons < 1 ltr	81	0,1%	25,3%
UHT milk cartons ≥ 1 ltr	1940	3,0%	22,9%
UHT milk cartons < 1 ltr	65	0,1%	11,1%
Yoghurt & dessert cartons ≥ 1 ltr	3631	5,7%	64,3%
Yoghurt & dessert cartons < 1 ltr	176	0,3%	44,7%
Juice cartons ≥ 1 ltr	2610	4,1%	19,1%
Juice cartons < 1 ltr	318	0,5%	19,8%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	456	0,7%	37,0%
Cartons with fresh mixes of juice & dairy < 1 ltr	0	0,0%	0,0%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	403	0,6%	41,6%
Cartons with UHT mixes of juice & dairy < 1 ltr	13	0,0%	27,3%
Residual cartons ≥ 1 ltr	69	0,1%	22,1%
Residual cartons < 1 ltr	457	0,7%	21,4%
Paper & board	4416	6,9%	
Plastics*	42936	67,3%	
Organic waste and indefinable waste	3657	5,7%	
Textile	234	0,4%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	447	0,7%	
Glass	125	0,2%	
Total	63824		

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
35,5	27,7	7,8
26,3	19,7	6,7
37,5	28,9	8,6
10,5	9,3	1,2
78,8	28,1	50,7
34,0	18,8	15,2
50,9	41,2	9,7
11,1	8,9	2,2
44,3	27,9	16,4
50,1	29,3	20,9
11,0	8,0	3,0
34,0	26,5	7,5
21,0	16,5	4,5

	Gross material content [%]	Net material content [%] ³	Moisture and dirt content [%] ⁴
Beverage	18,8%	12,1%	6,7%
Plastic	67,3%		
Residual waste	13,9%		



Notes	-
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***Further breakdown plastic fraction**
(Percentages based on the plastic weight)

	PET	PE	PP	PVC	PS	Total
Bottles	7,3%	1,2%	0,2%	0,0%	0,0%	8,8%
Flasks	4,5%	7,4%	3,0%	0,0%		14,9%
Rigids	14,0%	1,3%	9,5%	0,7%	3,6%	29,0%
Flexibles	0,1%	17,9%	4,2%	0,7%	0,0%	22,9%
Laminated flexibles	0,3%	3,9%	0,9%	0,0%	0,0%	5,1%
Non-packaging plastics	0,3%	3,1%	2,7%	1,2%	4,5%	11,8%
Undesired plastic packaging	0,0%	0,0%	0,0%	0,0%	0,4%	0,4%
Residual plastics						7,1%
Total	26,4%	34,8%	20,5%	2,5%	8,6%	100%

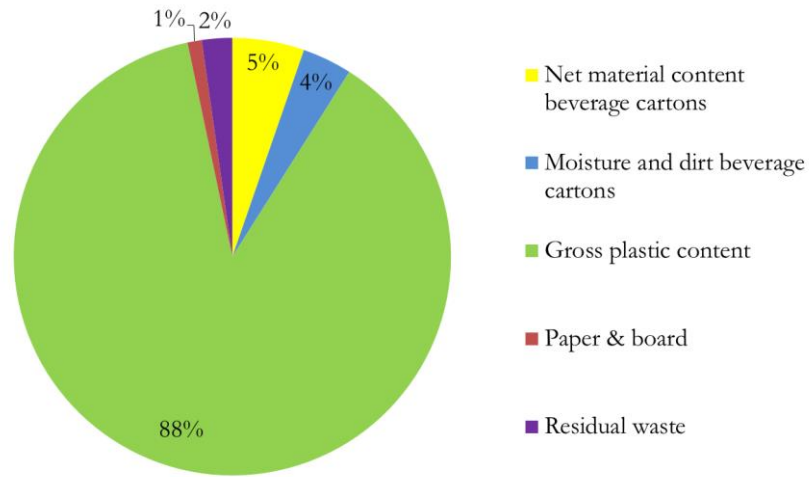
	Moisture and dirt content [%] ²
PET bottles transparent < 0,5 ltr	9,6%
PE flasks	10,4%
PP Rigids	1,6%
PET Rigids	4,4%
PE Flexibles > A4	2,6%

Municipality	Vught	Date of sampling	23-08-2013
Volume of sample	2 × 1 m ³ bigbag	Density of sample	33 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	1548	2,3%	25,7%
Milk cartons < 1 ltr	21	0,0%	18,2%
UHT milk cartons ≥ 1 ltr	161	0,2%	27,3%
UHT milk cartons < 1 ltr	0	0,0%	0,0%
Yoghurt & dessert cartons ≥ 1 ltr	1706	2,6%	71,1%
Yoghurt & dessert cartons < 1 ltr	110	0,2%	64,5%
Juice cartons ≥ 1 ltr	1435	2,2%	21,3%
Juice cartons < 1 ltr	51	0,1%	17,6%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	710	1,1%	42,5%
Cartons with fresh mixes of juice & dairy < 1 ltr	173	0,3%	51,2%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	0	0,0%	0,0%
Cartons with UHT mixes of juice & dairy < 1 ltr	0	0,0%	0,0%
Residual cartons ≥ 1 ltr	35	0,1%	11,1%
Residual cartons < 1 ltr	46	0,1%	25,5%
Paper & board	702	1,1%	
Plastics*	58515	87,7%	
Organic waste and indefinable waste	1236	1,9%	
Textile	50	0,1%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	209	0,3%	
Glass	0	0,0%	
Total	66708	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
40,8	30,3	10,5
22,0	18,0	4,0
40,3	29,3	11,0
96,6	27,9	68,7
55,0	19,5	35,5
45,6	35,9	9,7
10,2	8,4	1,8
47,1	27,1	20,0
17,2	8,4	8,8
36,0	32,0	4,0
23,5	17,5	6,0

	Gross material content [%]	Net material content [%] ³	Moisture and dirt content [%] ⁴
Beverage			
Plastic			
Residual waste			



Notes	-
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***Further breakdown plastic fraction**
(Percentages based on the plastic weight)

	PET	PE	PP	PVC	PS	Total
Bottles	9,1%	0,6%	0,0%	0,0%	0,0%	9,8%
Flasks	2,6%	8,4%	1,6%	0,0%		12,6%
Rigids	15,4%	1,8%	11,5%	0,8%	2,4%	31,9%
Flexibles	0,1%	17,8%	5,5%	0,3%	0,0%	23,7%
Laminated flexibles	0,7%	3,3%	1,4%	0,0%	0,0%	5,3%
Non-packaging plastics	0,1%	3,0%	3,7%	0,3%	1,8%	9,0%
Undesired plastic packaging	0,0%	0,0%	0,0%	0,1%	0,1%	0,1%
Residual plastics						7,6%
Total	27,9%	34,9%	23,7%	1,5%	4,3%	100%

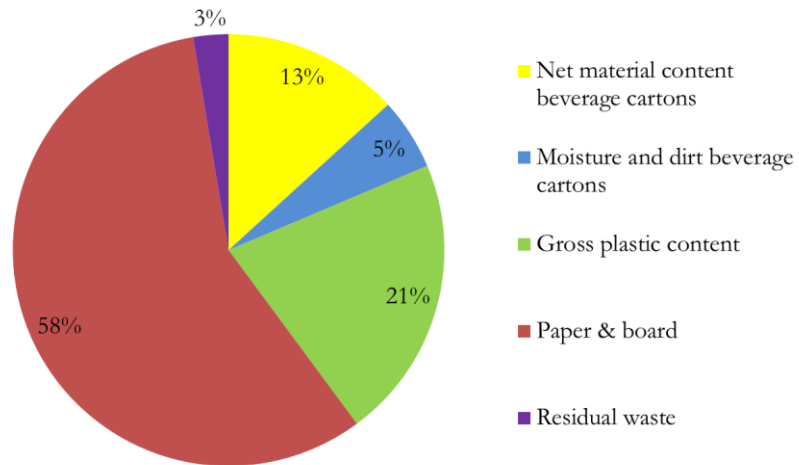
	Moisture and dirt content [%] ²
PET bottles transparent < 0,5 ltr	9,5%
PE flasks	20,8%
PP Rigids	10,1%
PET Rigids	3,6%
PE Flexibles > A4	3,7%

Municipality	Zeist	Date of sampling	27-09-2013
Volume of sample	2 × 1 m ³ bigbag	Density of sample	45 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	7061	7,8%	21,1%
Milk cartons < 1 ltr	57	0,1%	13,8%
UHT milk cartons ≥ 1 ltr	819	0,9%	20,7%
UHT milk cartons < 1 ltr	84	0,1%	38,6%
Yoghurt & dessert cartons ≥ 1 ltr	2486	2,7%	46,6%
Yoghurt & dessert cartons < 1 ltr	225	0,2%	47,6%
Juice cartons ≥ 1 ltr	3834	4,2%	27,9%
Juice cartons < 1 ltr	292	0,3%	24,5%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	796	0,9%	43,5%
Cartons with fresh mixes of juice & dairy < 1 ltr	145	0,2%	51,4%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	160	0,2%	43,2%
Cartons with UHT mixes of juice & dairy < 1 ltr	174	0,2%	40,4%
Residual cartons ≥ 1 ltr	647	0,7%	26,8%
Residual cartons < 1 ltr	160	0,2%	34,4%
Paper & board	52319	57,5%	
Plastics*	19330	21,2%	
Organic waste and indefinable waste	1802	2,0%	
Textile	14	0,0%	
Metals < 100 gram	55	0,1%	
Metals ≥ 100 gram	273	0,3%	
Glass	255	0,3%	
Total	90988	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
33,6	26,5	7,1
19,3	16,7	2,7
35,7	28,3	7,4
13,8	8,5	5,3
56,2	30,0	26,2
32,1	16,9	15,3
54,2	39,1	15,1
10,6	8,0	2,6
48,7	27,5	21,2
36,0	17,5	18,5
54,0	30,7	23,3
14,1	8,4	5,7
45,1	33,0	12,1
22,9	15,0	7,9

	Gross material content [%]	Net material content [%] ³	Moisture and dirt content [%] ⁴
Beverage	18,6%	13,2%	5,4%
Plastic	21,2%		
Residual waste	60,1%		



Notes	Relatively big amount of paper and board
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***Further breakdown plastic fraction**
(Percentages based on the plastic weight)

	PET	PE	PP	PVC	PS	Total
Bottles	6,7%	4,0%	0,2%	0,0%	0,2%	11,1%
Flasks	5,6%	6,0%	2,6%	0,0%		14,2%
Rigids	15,1%	1,1%	7,8%	0,5%	2,3%	26,8%
Flexibles	0,1%	21,2%	4,2%	0,1%	0,1%	25,7%
Laminated flexibles	0,2%	2,4%	1,1%	0,0%	0,0%	3,7%
Non-packaging plastics	0,2%	0,4%	13,9%	0,7%	0,8%	15,9%
Undesired plastic packaging	0,0%	0,0%	0,0%	0,1%	0,0%	0,1%
Residual plastics						2,4%
Total	27,8%	35,1%	29,8%	1,4%	3,4%	100%

	Moisture and dirt content [%] ²
PET bottles transparent < 0,5 ltr	7,1%
PE flasks	32,3%
PP Rigids	7,9%
PET Rigids	5,2%
PE Flexibles > A4	5,3%

Municipality	Marum, Grootegast and Leek (pressed)	Date of sampling	13-06-2013
Volume of sample	6 × 120 L bigbag	Density of sample	96 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹
Milk cartons ≥ 1 ltr	1767	2,5%
Milk cartons < 1 ltr	0	0,0%
UHT milk cartons ≥ 1 ltr	2389	3,4%
UHT milk cartons < 1 ltr	45	0,1%
Yoghurt & dessert cartons ≥ 1 ltr	2429	3,5%
Yoghurt & dessert cartons < 1 ltr	113	0,2%
Juice cartons ≥ 1 ltr	3281	4,7%
Juice cartons < 1 ltr	335	0,5%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	1462	2,1%
Cartons with fresh mixes of juice & dairy < 1 ltr	119	0,2%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	76	0,1%
Cartons with UHT mixes of juice & dairy < 1 ltr	0	0,0%
Residual cartons ≥ 1 ltr	175	0,3%
Residual cartons < 1 ltr	475	0,7%
Paper & board	12067	17,4%
Plastics*	39211	56,5%
Organic waste and indefinable waste	2225	3,2%
Textile	1944	2,8%
Metals < 100 gram	532	0,8%
Metals ≥ 100 gram	707	1,0%
Glass	100	0,1%
Total	69452	

***Further breakdown plastic fraction**

(Percentages based on the plastic weight)

	PET	PE	PP	PVC	PS	Total
Bottles	7,0%	0,3%	0,1%	0,0%	0,1%	7,4%
Flasks	3,9%	8,0%	1,4%	0,0%		13,3%
Rigids	11,2%	1,5%	10,3%	0,3%	3,8%	27,1%
Flexibles	0,0%	23,8%	5,8%	0,0%	0,0%	29,7%
Laminated flexibles	0,4%	3,0%	1,7%	0,0%	0,0%	5,1%
Non-packaging plastics	0,3%	2,8%	4,3%	0,4%	2,0%	9,7%
Undesired plastic packaging	0,0%	0,0%	0,2%	0,2%	0,3%	0,7%
Residual plastics						6,9%
Total	22,8%	39,3%	23,9%	0,9%	6,2%	100%

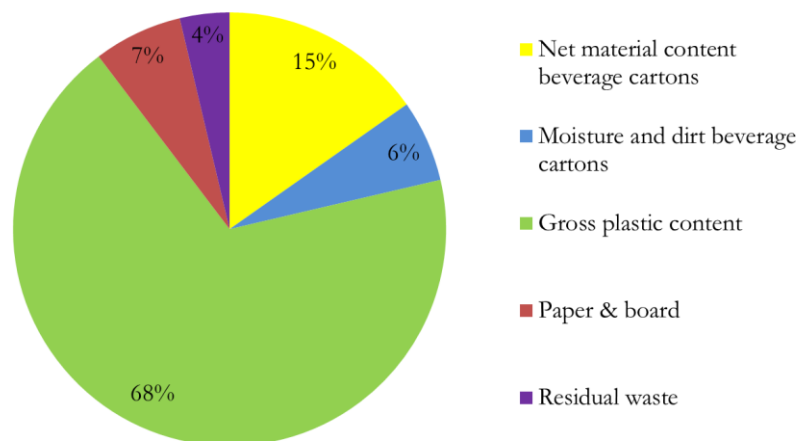
	Moisture and dirt content [%]²
PET bottles transparent < 0,5 ltr	19,3%
PE flasks	12,4%
PP Rigids	17,3%
PET Rigids	6,1%
PE Flexibles > A4	10,5%
Milk cartons ≥ 1 ltr	27,3%
UHT milk cartons ≥ 1 ltr	21,5%
Yoghurt & dessert cartons ≥ 1 ltr	40,4%
Juice cartons ≥ 1 ltr	24,5%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	35,6%

Municipality	Marum, Grootegast and Leek (not pressed)	Date of sampling	15-07-2013
Volume of sample	6 × 120 L bag	Density of sample	67 kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	856	1,8%	22,1%
Milk cartons < 1 ltr	18	0,0%	15,8%
UHT milk cartons ≥ 1 ltr	1953	4,1%	22,9%
UHT milk cartons < 1 ltr	44	0,1%	22,2%
Yoghurt & dessert cartons ≥ 1 ltr	2288	4,8%	35,6%
Yoghurt & dessert cartons < 1 ltr	62	0,1%	43,5%
Juice cartons ≥ 1 ltr	2590	5,4%	23,3%
Juice cartons < 1 ltr	129	0,3%	15,8%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	1280	2,7%	35,3%
Cartons with fresh mixes of juice & dairy < 1 ltr	116	0,2%	57,8%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	518	1,1%	31,1%
Cartons with UHT mixes of juice & dairy < 1 ltr	10	0,0%	18,2%
Residual cartons ≥ 1 ltr	34	0,1%	23,5%
Residual cartons < 1 ltr	344	0,7%	35,9%
Paper & board	3181	6,6%	
Plastics*	32780	68,3%	
Organic waste and indefinable waste	1075	2,2%	
Textile	263	0,5%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	439	0,9%	
Glass	0	0,0%	
Total	47980	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
42,5	33,1	9,4
19,0	16,0	3,0
37,6	29,0	8,6
11,3	8,8	2,5
41,8	26,9	14,9
31,0	17,5	13,5
51,5	39,5	12,0
10,1	8,5	1,6
42,8	27,7	15,1
38,7	16,3	22,3
47,0	32,4	14,6
11,0	9,0	2,0
34,0	26,0	8,0
27,0	17,3	9,7

	Gross material content [%]	Net material content [%] ³	Moisture and dirt content [%] ⁴
Beverage	21,3%	15,2%	6,1%
Plastic	68,3%		
Residual waste	10,3%		



Notes	
	Second run of input material, First run was pressed material, second run consisted of material that had not been pressed.

***Further breakdown plastic fraction**
(Percentages based on the plastic weight)

	PET	PE	PP	PVC	PS	Total
Bottles	4,0%	1,8%	0,3%	0,0%	0,0%	6,1%
Flasks	3,1%	8,1%	1,5%	0,0%		12,7%
Rigids	12,1%	2,3%	9,9%	0,8%	1,6%	26,6%
Flexibles	0,3%	28,4%	6,0%	0,2%	0,0%	35,0%
Laminated flexibles	0,4%	3,2%	2,1%	0,0%	0,0%	5,7%
Non-packaging plastics	0,0%	0,0%	1,2%	0,7%	0,4%	2,3%
Undesired plastic packaging	0,0%	0,4%	0,0%	0,2%	0,1%	0,8%
Residual plastics						10,8%
Total	20,0%	44,2%	21,0%	1,9%	2,1%	100%

	Moisture and dirt content [%] ²
PET bottles transparent < 0,5 ltr	7,08%
PE flasks	15,95%
PP Rigids	23,79%
PET Rigids	5,43%
PE Flexibles > A4	6,33%

C Sorting results per municipality – collection with paper and board as carrier

Sorting results of hand-sorted beverage cartons from collection of paper and board combined with beverage cartons.

List of municipalities:

- Etten-leur 1,1 (high rise buildings > 50%, city centre: indoor containers)
- Etten-leur 1,2 (high rise buildings > 50%, underground press container)
- Etten-leur 2 (high rise buildings < 10%, mini containers)
- Vianen
- Winsum

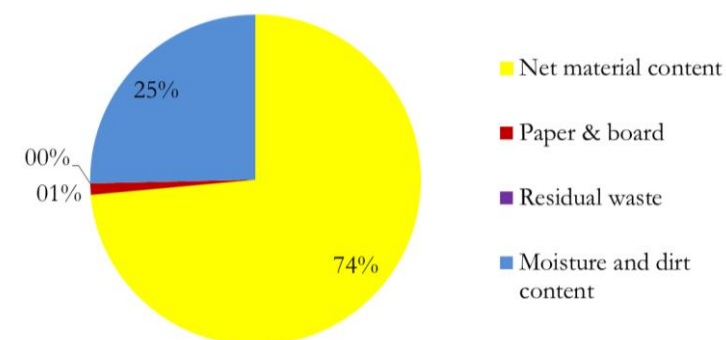
¹ Gross material content [%] calculated based on total weight of sample

² Moisture and dirt content [%] calculated per category

Municipality	Etten-leur 1,1	Date of sampling	22-08-2013
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Category of beverage cartons	Gross weight [g]	Gross material content [%] ¹	Moisture and dirt content [%] ²
Milk cartons ≥ 1 ltr	2686	19,8%	21,4%
Milk cartons < 1 ltr	129	1,0%	12,4%
UHT milk cartons ≥ 1 ltr	1333	9,8%	12,4%
UHT milk cartons < 1 ltr	0	0,0%	0,0%
Yoghurt & dessert cartons ≥ 1 ltr	3076	22,7%	46,6%
Yoghurt & dessert cartons < 1 ltr	283	2,1%	60,3%
Juice cartons ≥ 1 ltr	3867	28,5%	13,0%
Juice cartons < 1 ltr	20	0,1%	10,5%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	788	5,8%	42,9%
Cartons with fresh mixes of juice & dairy < 1 ltr	32	0,2%	43,8%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	43	0,3%	32,6%
Cartons with UHT mixes of juice & dairy < 1 ltr	0	0,0%	0,0%
Residual cartons ≥ 1 ltr	884	6,5%	16,9%
Residual cartons < 1 ltr	262	1,9%	20,3%
Paper & board	151	1,1%	
Plastics	0	0,0%	
Organic waste and indefinable waste	0	0,0%	
Textile	0	0,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	0	0,0%	
Glass	0	0,0%	
Total	13554	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
40,1	31,5	8,6
18,4	16,1	2,3
33,0	28,9	4,1
51,3	27,4	23,9
47,0	18,7	28,3
46,1	40,1	6,0
9,5	8,5	1,0
50,1	28,6	21,5
32,0	18,0	14,0
46,0	31,0	15,0
69,9	58,1	11,8
21,7	17,3	4,4

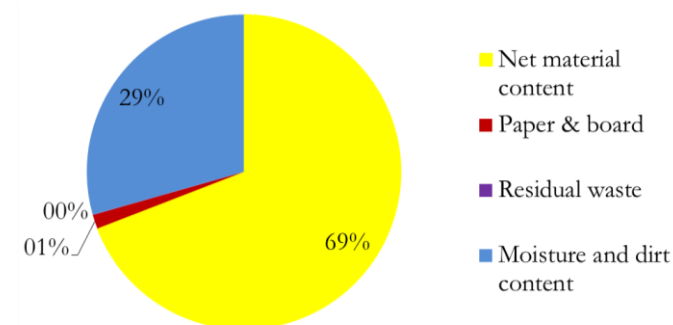


Notes	high rise buildings > 50%, city centre: indoor containers
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Municipality	Etten-leur 1,2	Date of sampling	19-09-2013
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Category of beverage cartons	Gross weight [g]	Gross material content [%]¹	Moisture and dirt content [%]²
Milk cartons ≥ 1 ltr	8922	21,8%	23,0%
Milk cartons < 1 ltr	308	0,8%	12,0%
UHT milk cartons ≥ 1 ltr	5679	13,9%	30,9%
UHT milk cartons < 1 ltr	138	0,3%	29,7%
Yoghurt & dessert cartons ≥ 1 ltr	5834	14,3%	65,9%
Yoghurt & dessert cartons < 1 ltr	434	1,1%	47,1%
Juice cartons ≥ 1 ltr	12874	31,5%	19,7%
Juice cartons < 1 ltr	325	0,8%	15,6%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	3187	7,8%	28,8%
Cartons with fresh mixes of juice & dairy < 1 ltr	165	0,4%	22,4%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	133	0,3%	33,6%
Cartons with UHT mixes of juice & dairy < 1 ltr	10	0,0%	10,0%
Residual cartons ≥ 1 ltr	1038	2,5%	14,2%
Residual cartons < 1 ltr	1259	3,1%	28,0%
Paper & board	591	1,4%	
Plastics	17	0,0%	
Organic waste and indefinable waste	0	0,0%	
Textile	0	0,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	0	0,0%	
Glass	0	0,0%	
Total	40914		

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
37,8	29,1	8,7
19,1	16,8	2,3
43,0	29,7	13,3
11,8	8,3	3,5
87,3	29,8	57,5
40,8	21,6	19,2
49,3	39,6	9,7
10,9	9,2	1,7
39,9	28,4	11,5
23,6	18,3	5,3
42,7	28,3	14,3
10,0	9,0	1,0
43,1	37,0	6,1
25,7	18,5	7,2

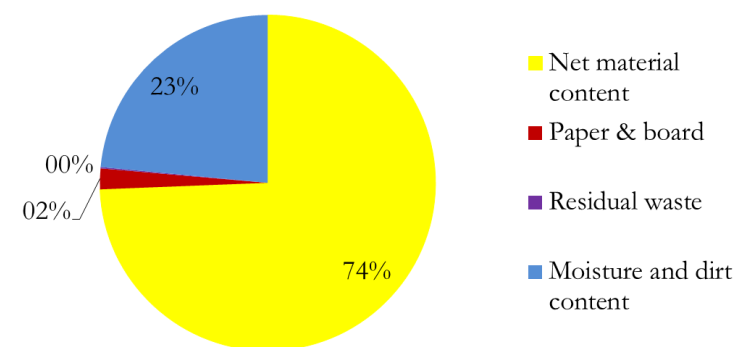


Notes	high rise buildings > 50%, underground press container
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Municipality	Etten-leur 2	Date of sampling	22-08-2013
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Category of beverage cartons	Gross weight [g]	Gross material content [%] ¹	Moisture and dirt content [%] ²
Milk cartons ≥ 1 ltr	16108	17,0%	23,9%
Milk cartons < 1 ltr	209	0,2%	14,4%
UHT milk cartons ≥ 1 ltr	16499	17,4%	23,3%
UHT milk cartons < 1 ltr	231	0,2%	23,4%
Yoghurt & dessert cartons ≥ 1 ltr	14291	15,0%	40,5%
Yoghurt & dessert cartons < 1 ltr	658	0,7%	54,7%
Juice cartons ≥ 1 ltr	32902	34,6%	16,1%
Juice cartons < 1 ltr	1030	1,1%	15,1%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	3589	3,8%	32,2%
Cartons with fresh mixes of juice & dairy < 1 ltr	301	0,3%	87,1%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	1651	1,7%	32,6%
Cartons with UHT mixes of juice & dairy < 1 ltr	256	0,3%	36,8%
Residual cartons ≥ 1 ltr	3371	3,5%	14,4%
Residual cartons < 1 ltr	1909	2,0%	22,8%
Paper & board	1896	2,0%	
Plastics	124	0,1%	
Organic waste and indefinable waste	0	0,0%	
Textile	0	0,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	0	0,0%	
Glass	0	0,0%	
Total	95025	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
39,5	30,1	9,5
20,8	17,8	3,0
36,1	27,7	8,4
11,1	8,5	2,6
43,5	25,9	17,6
49,7	22,5	27,2
49,8	41,8	8,0
10,6	9,0	1,6
45,1	30,6	14,5
64,0	8,3	55,8
46,0	31,0	15,0
47,0	29,7	17,3
49,2	42,1	7,1
22,4	17,3	5,1

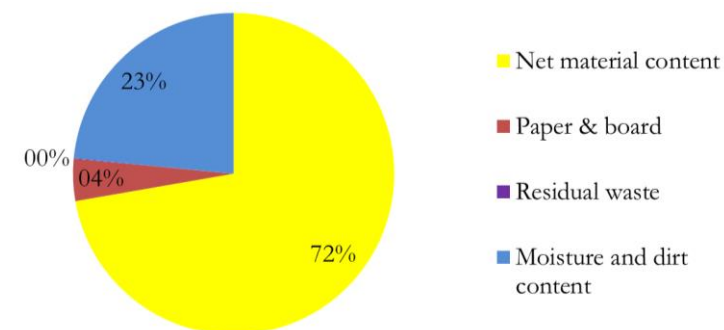


Notes	high rise buildings < 10%, mini containers
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Municipality	Vianen	Date of sampling	31-08-2013
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Category of beverage cartons	Gross weight [g]	Gross material content [%] ¹	Moisture and dirt content [%] ²
Milk cartons ≥ 1 ltr	1736	7,9%	16,0%
Milk cartons < 1 ltr	265	1,2%	21,6%
UHT milk cartons ≥ 1 ltr	1701	7,8%	27,5%
UHT milk cartons < 1 ltr	47	0,2%	27,7%
Yoghurt & dessert cartons ≥ 1 ltr	2151	9,8%	57,3%
Yoghurt & dessert cartons < 1 ltr	0	0,0%	0,0%
Juice cartons ≥ 1 ltr	11095	50,6%	18,2%
Juice cartons < 1 ltr	58	0,3%	14,0%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	1511	6,9%	34,9%
Cartons with fresh mixes of juice & dairy < 1 ltr	97	0,4%	44,3%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	686	3,1%	29,7%
Cartons with UHT mixes of juice & dairy < 1 ltr	13	0,1%	33,3%
Residual cartons ≥ 1 ltr	1337	6,1%	16,3%
Residual cartons < 1 ltr	277	1,3%	26,4%
Paper & board	922	4,2%	
Plastics	0	0,0%	
Organic waste and indefinable waste	15	0,1%	
Textile	0	0,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	0	0,0%	
Glass	0	0,0%	
Total	21911	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
34,9	29,3	5,6
23,2	18,2	5,0
41,1	29,8	11,3
11,8	8,5	3,3
64,1	27,4	36,7
47,9	39,2	8,7
9,5	8,2	1,3
46,4	30,2	16,2
32,3	18,0	14,3
43,5	30,6	12,9
12,0	8,0	4,0
47,9	40,1	7,8
23,1	17,0	6,1

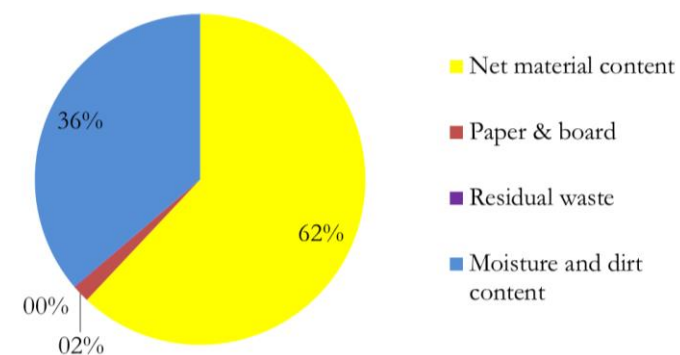


Notes	-
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Municipality	Winsum	Date of sampling	02-10-2013
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Category of beverage cartons	Gross weight [g]	Gross material content [%] ¹	Moisture and dirt content [%] ²
Milk cartons ≥ 1 ltr	5674	17,9%	29,8%
Milk cartons < 1 ltr	21	0,1%	14,3%
UHT milk cartons ≥ 1 ltr	3029	9,5%	27,5%
UHT milk cartons < 1 ltr	96	0,3%	21,9%
Yoghurt & dessert cartons ≥ 1 ltr	8009	25,2%	68,5%
Yoghurt & dessert cartons < 1 ltr	165	0,5%	68,1%
Juice cartons ≥ 1 ltr	9572	30,1%	19,7%
Juice cartons < 1 ltr	303	1,0%	19,4%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	812	2,6%	51,2%
Cartons with fresh mixes of juice & dairy < 1 ltr	40	0,1%	10,0%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	862	2,7%	35,7%
Cartons with UHT mixes of juice & dairy < 1 ltr	522	1,6%	31,4%
Residual cartons ≥ 1 ltr	866	2,7%	21,1%
Residual cartons < 1 ltr	1247	3,9%	28,0%
Paper & board	535	1,7%	
Plastics	21	0,1%	
Organic waste and indefinable waste	0	0,0%	
Textile	0	0,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	0	0,0%	
Glass	0	0,0%	
Total	31774	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
45,0	31,6	13,4
21,0	18,0	3,0
41,8	30,3	11,5
10,7	8,3	2,3
89,8	28,3	61,5
54,3	17,3	37,0
52,8	42,4	10,4
9,8	7,9	1,9
61,7	30,1	31,6
20,0	18,0	2,0
45,7	29,4	16,3
14,0	9,6	4,4
33,7	26,6	7,1
24,6	17,7	6,9



Notes	-
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D Sorting results recovery

Sorting results of recovered beverage cartons from MSW.

List of municipalities:

- Omrin
- Augustin

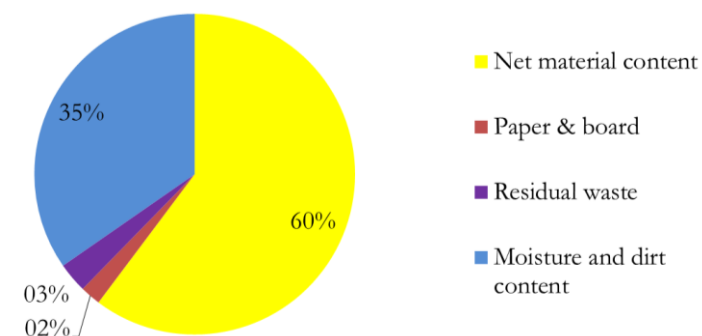
¹ Gross material content [%] calculated based on total weight of sample

² Moisture and dirt content [%] calculated per category

Municipality	Omrin Beverage Carton Product (average)	Date of sampling	24-09-2013
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Category of beverage cartons	Gross weight [g]	Gross material content [%] ¹	Moisture and dirt content [%] ²
Milk cartons ≥ 1 ltr	17866	12,7%	31,6%
Milk cartons < 1 ltr	300	0,2%	32,5%
UHT milk cartons ≥ 1 ltr	21969	15,6%	30,5%
UHT milk cartons < 1 ltr	724	0,5%	37,6%
Yoghurt & dessert cartons ≥ 1 ltr	36509	25,9%	51,5%
Yoghurt & dessert cartons < 1 ltr	866	0,6%	45,9%
Juice cartons ≥ 1 ltr	29888	21,2%	26,5%
Juice cartons < 1 ltr	3527	2,5%	26,7%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	9724	6,9%	39,3%
Cartons with fresh mixes of juice & dairy < 1 ltr	388	0,3%	41,8%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	3072	2,2%	34,9%
Cartons with UHT mixes of juice & dairy < 1 ltr	716	0,5%	33,6%
Residual cartons ≥ 1 ltr	2907	2,1%	35,4%
Residual cartons < 1 ltr	5421	3,8%	32,8%
Paper & board	2913	2,1%	
Plastics	3745	2,7%	
Organic waste and indefinable waste	435	0,3%	
Textile	0	0,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	91	0,1%	
Glass	0	0,0%	
Total	141061	100%	

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
39,3	26,9	12,4
25,7	17,3	8,3
43,6	30,3	13,3
13,6	8,5	5,1
56,2	27,3	29,0
32,3	17,5	14,8
53,6	39,4	14,2
11,5	8,4	3,1
44,2	26,8	17,4
30,3	17,7	12,7
45,3	29,5	15,8
13,1	8,7	4,4
47,9	30,9	17,0
24,4	16,4	8,0

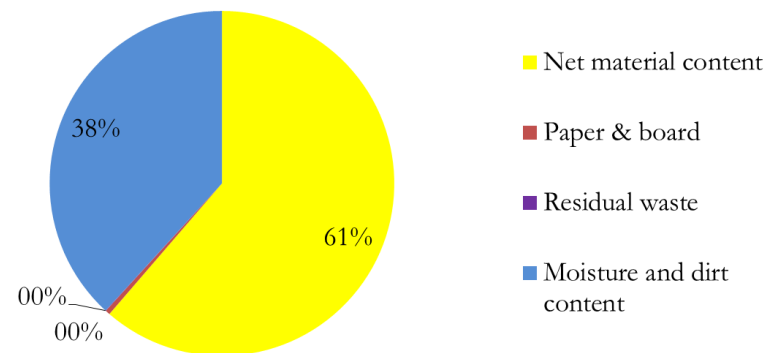


Notes	-
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Municipality	Augustin Beverage Carton Product (main)	Date of sampling	
Volume of sample	1 m ³ bigbag	Density of sample	xx kg/m ³

Category of beverage cartons	Gross weight [g]	Gross material content [%] ¹	Moisture and dirt content [%] ²
Milk cartons ≥ 1 ltr	427	9,4%	33,3%
Milk cartons < 1 ltr	0	0,0%	0,0%
UHT milk cartons ≥ 1 ltr	804	17,6%	43,9%
UHT milk cartons < 1 ltr	13	0,3%	33,3%
Yoghurt & dessert cartons ≥ 1 ltr	1006	22,0%	45,7%
Yoghurt & dessert cartons < 1 ltr	0	0,0%	0,0%
Juice cartons ≥ 1 ltr	1452	31,8%	30,0%
Juice cartons < 1 ltr	72	1,6%	26,4%
Cartons with fresh mixes of juice & dairy ≥ 1 ltr	228	5,0%	42,1%
Cartons with fresh mixes of juice & dairy < 1 ltr	0	0,0%	0,0%
Cartons with UHT mixes of juice & dairy ≥ 1 ltr	212	4,6%	48,8%
Cartons with UHT mixes of juice & dairy < 1 ltr	0	0,0%	0,0%
Residual cartons ≥ 1 ltr	120	2,6%	31,7%
Residual cartons < 1 ltr	208	4,6%	44,0%
Paper & board	20	0,4%	
Plastics	2	0,0%	
Organic waste and indefinable waste	0	0,0%	
Textile	0	0,0%	
Metals < 100 gram	0	0,0%	
Metals ≥ 100 gram	0	0,0%	
Glass	0	0,0%	
Total	4564		

Weight per beverage carton		Moisture and dirt per carton
[gross g]	[net g]	[g]
42,6	28,4	14,2
50,6	28,4	22,2
12,0	8	4
49,4	26,8	22,6
56,7	39,7	17
12,0	8,8	3,2
45,6	26,4	19,2
52,8	27	25,75
40,0	27,3	12,7
25,9	14,5	11,4



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E Mechanical properties of hand-sheets and pulps

1.1 Mechanical properties of hand-sheets produced from the pulps as obtained

		recycled	German reference	Hedra	Schön-machers	Attero	Omnin	Sita
drainability (° SR)	mean	43	21	22	23	20	23	24
grammage (g/m ²)	mean	81.78	86.23	84.81	82.60	81.28	84.65	89.85
	stdev	0.73	1.61	1.42	4.04	2.07	1.47	2.13
	+ (95 %)	0.52	1.15	1.02	2.89	1.48	1.05	1.52
thickness (single sheet)								
Bulk (cm ³ /g)	mean	1.76	1.95	1.96	1.93	1.94	1.90	1.63
	stdev	0.09	0.21	0.24	0.29	0.15	0.20	0.09
	+ (95 %)	0.07	0.16	0.19	0.21	0.11	0.14	0.06
apparent sheet density (g/cm ³)	mean	0.57	0.52	0.52	0.53	0.52	0.53	0.61
	stdev	0.03	0.05	0.06	0.07	0.04	0.05	0.03
	+ (95 %)	0.02	0.04	0.05	0.05	0.03	0.04	0.02
tensile properties								
breaking length (km)	mean	2.37	3.13	2.85	2.93	2.82	3.45	3.27
	stdev	0.17	0.21	0.63	0.46	0.24	0.36	0.48
	+ (95 %)	0.13	0.17	0.48	0.39	0.20	0.28	0.37
tensile index (Nm/g)	mean	23.2	30.7	28.0	28.7	27.7	33.8	32.0
	stdev	1.6	2.0	6.2	4.6	2.4	3.5	4.7
	+ (95 %)	1.3	1.7	4.7	3.8	2.0	2.7	3.6
T.E.A.-index (mJ/g)	mean	237	320	208	255	272	365	404
	stdev	59	92	129	116	83	117	133
	+ (95 %)	46	77	99	97	69	97	139
E-modulus (Gpa)	mean	2.16	2.59	2.61	2.56	2.44	2.92	3.11
	stdev	0.16	0.28	0.29	0.31	0.21	0.35	0.38
	+ (95 %)	0.12	0.23	0.22	0.26	0.17	0.25	0.27
strain (%)	mean	1.46	1.48	1.04	1.25	1.38	1.48	1.63
	stdev	0.26	0.30	0.41	0.37	0.30	0.33	0.38
	+ (95 %)	0.20	0.25	0.32	0.31	0.25	0.27	0.39
tearing resistance index (mNm ² /g)	mean	6.5	10.1	7.6	7.8	8.8	11.0	9.7
	stdev	0.5	0.5	0.6	0.5	0.4	0.7	0.5
	+ (95 %)	0.8	0.8	0.9	0.8	0.6	1.2	0.7
SCT index (Nm/g)	mean	14.4	17.5	16.9	17.8	15.4	19.7	19.4
	stdev	0.8	1.1	1.8	1.5	1.4	1.3	3.1
	+ (95 %)	0.6	0.8	1.4	1.1	1.1	0.6	1.5
air permeance (ml/min)	mean	725	1650	1286	1401	1744	1016	852
	stdev	37	55	116	64	77	72	60
	+ (95 %)	27	39	90	46	60	52	43
roughness								
smooth side (ml/min)	mean	702	774	1479	945	930	791	1124
	stdev	400	276	474	278	340	293	432
	+ (95 %)							
internal bond (kJ/m ²)	mean	107	116	120	105	103	124	152
	stdev	11	16	17	6	15	11	14
	+ (95 %)	6	9	10	4	8	6	8

1.2 Mechanical properties of hand-sheets produced from a mixture of 20% pulp and 80% recycled paper

		recycled	German reference	Hedra	Schön-machers	Attero	Omrin	Sita	
drainability (° SR)	mean	43	36	37	37	37	39	35	
	grammage (g/m ²)	mean	81.78	81.88	84.33	82.88	85.22	92.34	88.94
	stddev	0.73	1.29	1.36	1.46	2.21	1.29	1.80	
	+ (95 %)	0.52	0.92	0.97	1.04	1.58	0.92	1.29	
thickness (single sheet)									
Bulk (cm ³ /g)	mean	1.76	1.82	1.77	1.83	1.76	1.75	1.78	
	stddev	0.09	0.09	0.20	0.18	0.07	0.14	0.13	
	+ (95 %)	0.07	0.06	0.14	0.13	0.05	0.10	0.09	
apparent sheet density (g/cm ³)	mean	0.57	0.55	0.57	0.55	0.57	0.57	0.56	
	stddev	0.03	0.03	0.05	0.05	0.02	0.04	0.04	
	+ (95 %)	0.02	0.02	0.04	0.03	0.01	0.03	0.03	
tensile properties									
breaking length (km)	mean	2.37	2.66	2.64	2.57	2.52	2.91	2.67	
	stddev	0.17	0.16	0.37	0.09	0.23	0.13	0.19	
	+ (95 %)	0.13	0.12	0.31	0.07	0.18	0.09	0.14	
tensile index (Nm/g)	mean	23.2	26.1	25.9	25.2	24.7	28.5	26.2	
	stddev	1.6	1.6	3.7	0.8	2.3	1.3	1.9	
	+ (95 %)	1.3	1.2	3.0	0.6	1.8	0.9	1.4	
T.E.A.-index (mJ/g)	mean	237	278	248	253	248	311	282	
	stddev	59	58	78	61	68	50	47	
	+ (95 %)	46	45	65	47	53	36	36	
E-modulus (Gpa)	mean	2.15	2.31	2.42	2.09	2.33	2.56	2.41	
	stddev	0.16	0.16	0.22	0.73	0.15	0.23	0.18	
	+ (95 %)	0.12	0.12	0.19	0.56	0.11	0.16	0.13	
strain (%)	mean	1.46	1.51	32.59	1.38	1.40	1.55	1.50	
	stddev	0.26	0.21	4.34	0.16	0.25	0.17	0.18	
	+ (95 %)	0.20	0.16	3.62	0.12	0.19	0.12	0.14	
tearing resistance index (mNm ² /g)	mean	6.5	8.3	7.2	6.7	7.2	8.1	7.4	
	stddev	0.5	1.6	0.4	0.4	0.3	0.7	0.5	
	+ (95 %)	0.8	2.6	0.6	0.6	0.5	1.0	0.8	
SCT index (Nm/g)	mean	14.4	15.6	15.7	15.0	14.8	16.4	16.2	
	stddev	0.8	0.9	1.0	0.8	0.6	1.1	1.1	
	+ (95 %)	0.6	0.7	0.8	0.6	0.5	0.6	0.5	
air permeance (ml/min)	mean	725	928	812	819	841	644	775	
	stddev	37	42	35	49	32	42	40	
	+ (95 %)	27	30	25	35	24	30	28	
roughness									
smooth side (ml/min)	mean	702	630	628	610	577	647	604	
	stddev	400	280	270	469	235	179	129	
	+ (95 %)								
internal bond (kJ/m ²)	mean	107	112	110	108	106	123	122	
	stddev	11	6	17	4	5	13	10	
	+ (95 %)	6	3	10	2	3	7	6	

1.3 Mechanical properties of hand-sheets produced from the pulps after additional cleaning and refining

		German Reference		
		0	2500	4000
revolutions PFI		15	27	40
drainability ($^{\circ}$ SR)	mean	89.66	87.12	86.62
	stdev	2.28	6.23	0.80
	+ (95 %)	1.90	5.77	0.74
<i>thickness (single sheet)</i>				
	mean	1.67	1.49	1.45
Bulk (cm^3/g)	stdev	0.04	0.05	0.05
	+ (95 %)	0.03	0.04	0.05
	mean	0.60	0.67	0.69
apparent sheet density (g/cm^3)	stdev	0.01	0.02	0.02
	+ (95 %)	0.01	0.02	0.02
<i>tensile properties</i>				
	mean	3.41	6.41	7.01
breaking length (km)	stdev	0.09	0.36	0.59
	+ (95 %)	0.09	0.38	0.62
	mean	33.5	62.9	68.8
tensile index (Nm/g)	stdev	0.9	3.5	5.8
	+ (95 %)	0.9	3.7	6.1
	mean	395	1041	1184
T.E.A.-index (mJ/g)	stdev	31	139	221
	+ (95 %)	33	145	232
	mean	3.20	5.16	5.61
E-modulus (Gpa)	stdev	0.10	0.21	0.45
	+ (95 %)	0.11	0.22	0.47
	mean	1.64	2.33	2.43
strain (%)	stdev	0.13	0.18	0.25
	+ (95 %)	0.14	0.19	0.26
	mean	10.7	11.2	9.8
tearing resistance index (mNm^2/g)	stdev	0.4	0.0	0.6
	+ (95 %)	1.1	0.0	1.5
	mean	19.3	27.9	31.1
SCT index (Nm/g)	stdev	1.0	2.2	1.4
	+ (95 %)	0.6	1.4	0.9
	mean	2983	345	125
air permeance (ml/min)	stdev	176	84	6
	+ (95 %)	147	78	6
<i>roughness</i>				
	mean	568	509	804
smooth side (ml/min)	stdev	97	151	432
	+ (95 %)			
	mean	121	281	369
internal bond (kJ/m^2)	stdev	17	26	33
	+ (95 %)	12	19	23

Separate collected				
revolutions PFI		0	1000	2000
drainability ($^{\circ}$ SR)	mean	15	30	52
grammage (g/m^2)	mean	92.46	87.57	86.86
	stdev	2.09	1.24	1.09
	+ (95 %)	1.74	1.04	0.91
<i>thickness (single sheet)</i>				
Bulk (cm^3/g)	mean	1.77	1.47	1.36
	stdev	0.13	0.02	0.02
	+ (95 %)	0.10	0.02	0.02
apparent sheet density (g/cm^3)	mean	0.57	0.68	0.74
	stdev	0.04	0.01	0.01
	+ (95 %)	0.03	0.01	0.01
<i>tensile properties</i>				
breaking length (km)	mean	3.22	4.37	5.16
	stdev	0.05	0.21	0.16
	+ (95 %)	0.06	0.22	0.17
tensile index (Nm/g)	mean	31.5	42.9	50.6
	stdev	0.5	2.0	1.5
	+ (95 %)	0.5	2.1	1.6
T.E.A.-index (mJ/g)	mean	291	403	479
	stdev	15	80	71
	+ (95 %)	16	84	74
E-modulus (Gpa)	mean	3.03	4.44	5.48
	stdev	0.25	0.28	0.17
	+ (95 %)	0.27	0.29	0.18
strain (%)	mean	1.33	1.37	1.39
	stdev	0.06	0.18	0.14
	+ (95 %)	0.06	0.19	0.15
tearing resistance index (mNm^2/g)	mean	8.0	5.3	5.0
	stdev	0.4	0.0	0.4
	+ (95 %)	0.9	0.0	1.0
SCT index (Nm/g)	mean	20.2	26.5	32.2
	stdev	1.3	1.1	1.4
	+ (95 %)	0.9	0.7	0.9
air permeance (ml/min)	mean	3826	466	78
	stdev	151	36	9
	+ (95 %)	126	30	7
<i>roughness</i>				
smooth side (ml/min)	mean	759	427	472
	stdev	193	75	105
	+ (95 %)			
internal bond (kJ/m^2)	mean	132	266	539
	stdev	23	23	45
	+ (95 %)	18	16	32

Co-collected w/plastics MZ

revolutions PFI		0	1500	2000
drainability (° SR)	mean	16	32	42
grammage (g/m ²)	mean	83.11	89.91	87.38
	stdev	2.29	0.83	1.05
	+ (95 %)	2.12	0.77	0.87
<i>thickness (single sheet)</i>				
Bulk (cm ³ /g)	mean	1.80	1.47	1.44
	stdev	0.09	0.03	0.04
	+ (95 %)	0.08	0.03	0.03
apparent sheet density (g/cm ³)	mean	0.56	0.68	0.70
	stdev	0.03	0.01	0.02
	+ (95 %)	0.02	0.01	0.02
<i>tensile properties</i>				
breaking length (km)	mean	2.78	4.56	5.17
	stdev	0.16	0.14	0.12
	+ (95 %)	0.17	0.14	0.13
tensile index (Nm/g)	mean	27.3	44.7	50.7
	stdev	1.6	1.3	1.2
	+ (95 %)	1.6	1.4	1.3
T.E.A.-index (mJ/g)	mean	254	445	597
	stdev	40	51	51
	+ (95 %)	42	54	54
E-modulus (Gpa)	mean	2.72	4.49	4.90
	stdev	0.12	0.18	0.23
	+ (95 %)	0.13	0.19	0.24
strain (%)	mean	1.31	1.45	1.68
	stdev	0.13	0.12	0.10
	+ (95 %)	0.13	0.12	0.11
tearing resistance index (mNm ² /g)	mean	8.4	6.0	5.6
	stdev	0.7	0.2	0.1
	+ (95 %)	1.7	0.4	0.2
SCT index (Nm/g)	mean	16.1	26.8	29.1
	stdev	3.8	1.3	1.5
	+ (95 %)	2.5	0.8	1.0
air permeance (ml/min)	mean	4211	348	172
	stdev	404	34	10
	+ (95 %)	374	32	9
<i>roughness</i>				
smooth side (ml/min)	mean	665	550	432
	stdev	77	114	115
	+ (95 %)			
internal bond (kJ/m ²)	mean	96	252	347
	stdev	18	15	28
	+ (95 %)	13	11	20

Recovery, Attero				
revolutions PFI		0	2000	3000
drainability ($^{\circ}$ SR)	mean	16	33	50
grammage (g/m^2)	mean	87.61	88.68	89.95
	stdev	1.62	1.24	1.20
	+ (95 %)	1.36	1.03	1.12
<i>thickness (single sheet)</i>				
Bulk (cm^3/g)	mean	1.73	1.42	1.39
	stdev	0.04	0.02	0.04
	+ (95 %)	0.03	0.02	0.04
apparent sheet density (g/cm^3)	mean	0.58	0.71	0.72
	stdev	0.01	0.01	0.02
	+ (95 %)	0.01	0.01	0.02
<i>tensile properties</i>				
breaking length (km)	mean	2.85	5.22	5.56
	stdev	0.10	0.23	0.36
	+ (95 %)	0.10	0.24	0.45
tensile index (Nm/g)	mean	28.0	51.2	54.5
	stdev	1.0	2.3	3.5
	+ (95 %)	1.0	2.4	4.4
T.E.A.-index (mJ/g)	mean	270	644	669
	stdev	25	146	179
	+ (95 %)	26	153	222
E-modulus (Gpa)	mean	2.82	4.96	5.47
	stdev	0.14	0.17	0.18
	+ (95 %)	0.14	0.18	0.23
strain (%)	mean	1.37	1.79	1.74
	stdev	0.10	0.30	0.33
	+ (95 %)	0.11	0.31	0.42
tearing resistance index (mNm^2/g)	mean	9.0	7.7	6.6
	stdev	0.3	0.6	0.9
	+ (95 %)	0.9	1.5	2.4
SCT index (Nm/g)	mean	16.8	26.9	30.0
	stdev	1.1	1.7	1.6
	+ (95 %)	0.7	1.1	1.0
air permeance (ml/min)	mean	3301	236	92
	stdev	134	17	8
	+ (95 %)	112	14	7
<i>roughness</i>				
smooth side (ml/min)	mean	587	477	523
	stdev	158	74	71
	+ (95 %)	#N/A	#N/A	#N/A
internal bond (kJ/m^2)	mean	100	269	365
	stdev	16	27	25
	+ (95 %)	12	19	18

Recovery, Omrin				
revolutions PFI		0	2000	3500
drainability (° SR)	mean	16	28	43
	mean	84.97	88.33	83.74
grammage (g/m ²)	stdev	1.42	0.92	1.19
	+ (95 %)	1.18	0.85	1.10
<i>thickness (single sheet)</i>				
	mean	1.65	1.46	1.39
Bulk (cm ³ /g)	stdev	0.02	0.03	0.03
	+ (95 %)	0.02	0.03	0.03
	mean	0.60	0.69	0.72
apparent sheet density (g/cm ³)	stdev	0.01	0.01	0.02
	+ (95 %)	0.01	0.01	0.02
<i>tensile properties</i>				
	mean	3.52	5.79	6.45
breaking length (km)	stdev	0.10	0.18	0.39
	+ (95 %)	0.10	0.19	0.40
	mean	34.5	56.8	63.2
tensile index (Nm/g)	stdev	1.0	1.8	3.8
	+ (95 %)	1.0	1.9	4.0
	mean	398	890	965
T.E.A.-index (mJ/g)	stdev	44	109	125
	+ (95 %)	46	114	131
	mean	3.36	4.94	5.67
E-modulus (Gpa)	stdev	0.08	0.17	0.31
	+ (95 %)	0.08	0.18	0.32
	mean	1.62	2.20	2.17
strain (%)	stdev	0.12	0.20	0.16
	+ (95 %)	0.13	0.21	0.17
	mean	11.6	9.4	8.5
tearing resistance index (mNm ² /g)	stdev	1.2	0.2	0.3
	+ (95 %)	2.9	0.5	0.7
	mean	19.2	27.5	29.5
SCT index (Nm/g)	stdev	1.3	1.8	1.9
	+ (95 %)	0.8	1.2	1.2
	mean	2695	275	100
air permeance (ml/min)	stdev	150	28	5
	+ (95 %)	125	26	5
<i>roughness</i>				
	mean	643	537	484
smooth side (ml/min)	stdev	133	154	69
	+ (95 %)	#N/A	#N/A	#N/A
	mean	107	280	346
internal bond (kJ/m ²)	stdev	6	23	42
	+ (95 %)	4	16	30

Co-collected w/plastics KH

revolutions PFI		0	1000	2000
drainability ($^{\circ}$ SR)	mean	17	30	45
grammage (g/m^2)	mean	86.00	89.98	87.79
	stdev	2.35	0.71	0.89
	+ (95	1.96	0.60	0.82
<i>thickness (single sheet)</i>				
Bulk (cm^3/g)	mean	1.68	1.54	3.28
	stdev	0.03	0.06	4.87
	+ (95	0.03	0.05	4.51
apparent sheet density (g/cm^3)	mean	0.60	0.65	0.60
	stdev	0.01	0.02	0.24
	+ (95	0.01	0.02	0.22
<i>tensile properties</i>				
breaking length (km)	mean	3.66	4.83	5.36
	stdev	0.07	0.23	0.21
	+ (95	0.07	0.25	0.22
tensile index (Nm/g)	mean	35.9	47.4	52.6
	stdev	0.6	2.3	2.0
	+ (95	0.7	2.4	2.1
T.E.A.-index (mJ/g)	mean	445	606	658
	stdev	23	107	85
	+ (95	24	112	89
E-modulus (Gpa)	mean	3.28	4.42	4.29
	stdev	0.15	0.13	1.86
	+ (95	0.16	0.13	1.95
strain (%)	mean	1.71	1.80	1.78
	stdev	0.05	0.22	0.16
	+ (95	0.06	0.23	0.16
tearing resistance index (mNm^2/g)	mean	8.2	7.1	7.0
	stdev	0.1	0.0	0.9
	+ (95	0.3	0.0	2.3
SCT index (Nm/g)	mean	20.5	25.8	28.8
	stdev	1.2	0.9	0.8
	+ (95	0.8	0.6	0.5
air permeance (ml/min)	mean	2224	493	123
	stdev	206	30	11
	+ (95	172	25	10
<i>roughness</i>				
smooth side (ml/min)	mean	621	632	521
	stdev	186	209	140
	+ (95	#N/A	#N/A	#N/A
internal bond (kJ/m^2)	mean	125	223	355
	stdev	5	25	20
	+ (95	4	18	15

1.4 General properties of the pulps and “white water”

Several properties of the pulps as obtained and pressed out “white water” have been tested

		WRV	Ash content	ZeTa potential	conductivity	COD
		Gr/gr	Wt%	mV	mS	mg/l
German reference		1.46	3.2	-19.4	0.437	225
Separate collected		1.47	6.3	-12.5	0.737	643
Co-collected w/pl. MZ		1.47	4.3	-13.5	0.743	526
Co-collected w/pl. KH		1.69	4.7	-12.2	0.622	480
Recovery, Attero		1.42	2.4	-27.2	0.429	225
Recovery, Omrin		1.49	4.2	-13	0.713	494

REVIEW COMMITTEE PILOT BEVERAGE CARTONS

Recommendations of the Technological Environmental Review Committee

A meeting of the Technological Environmental Review Committee (TERC) was held on 26th November 2013 at the offices of TNO Hoofddorp, Amsterdam at which the project outcomes and reports for the Pilot Beverage Cartons, technical and environmental work programme were discussed. Two reports were made available for the review:

- **Report 1** “Pilot Beverage Cartons. Technical Report”. Version dated 18th November 2013.
- **Report 2** “Life Cycle Assessment of Beverage Carton Collection Systems”. Version dated 21st November 2013.

The following are the observations and recommendations of the TERC in relation to the work reviewed on beverage cartons (BC's).

OBSERVATION 1

The project team is to be commended on both the amount and quality of the work carried out to meet the aims and objectives laid out in the Dutch framework treaty of 27 June 2012 article 3-6. It is recognized that the timescales for the pilot have been very tight but nevertheless the team has brought to bear its resources, know-how and expertise to deliver an excellent and comprehensive study that is of both national and international importance. It is recognized that the Dutch national pilot on beverage cartons is both ground-breaking in its scope and unique in its depth of investigations.

OBSERVATION 2

It is recognized by the TERC that at the time of the review meeting on 26th November 2013 the two reports furnished for review were at a draft stage, some data are still awaited, and analysis of the results is still taking place. The following recommendations are therefore made cognisant of the development currently being progressed.

RECOMMENDATION 1 (Structure of Report 1)

The current draft of report 1 is not easy to read as there is an imbalance between (i) description of the context for and strategic imperative of the work and (ii) the technical descriptions and plethora of results, including numerous tables and figures. This imbalance makes it difficult to recognise the primary audience for the report and to gauge how well the report might read to that audience. It is recommended that the current draft report is converted en-masse to a series of technical appendices, without altering the order, nature, text or presentation of results (i.e. tables and figures). It is further recommended that a main body of the report is written for whom the intended audience is, for example, a policy maker or member of the public interested in environmental affairs. This will help to guide the style of the writing as well as inform the degree to which technical details of the study are included. This main body should be more than an ‘Executive Summary’. It is recommended that the main body of the report is kept to about 15-20 pages and that it covers the following key points:

- i. *Why do the pilot?* This should include a description of why the pilot was initiated and an explanation of its strategic purpose.
- ii. *The present situation.* This should include an outline of the structure of typical beverage cartons and the materials they are constructed from and an overview of the current situation vis-à-vis the numbers of beverage cartons placed on the Dutch market and the current (as per 1Q 2013) collection and recycling infrastructure.
- iii. *The unknowns to be investigated.* This should provide an overview of the key parameters, characteristics, dynamics and behaviors (including consumer behaviors) of the end-of-life stages of beverage carton collection and recycling (C&R) which the pilot study was intended to investigate.
- iv. *How the pilot was done.* This should provide an overview of the how the pilot study was configured and carried out in order to uncover the unknowns.
- v. *What was found?* This should provide an overview of the key findings and discoveries of the investigation. It is recommended that this includes:
 - a. A Figure comprising three Sankey diagrams illustrating full municipal waste stream, dirty BC's, and fibre to demonstrate how much of the full waste stream is constituted by recoverable BC material. This should be supplemented by an account (e.g. list) of typical mechanisms for which the BC and BC materials are lost through the C&R system as well as operational aspects of the EOL system that either enhance or diminish the recovery performance.
 - b. Figures which show the 'big picture' (e.g. net collection yield versus rural/urban collection characteristics) across all contributing collection systems in the pilot
 - c. Analysis of factors governing the net collection yield. It is recognized that there is some uncertainty over the total amount of BC placed on the Dutch market (circa 70 kt as per a 2011 study) and the level of regional variation of tonnages. There is some indication that tonnages per capita in rural areas are greater than those in urban areas (by about 10%). Failure to properly account for rural/urban characteristics can, when using national data (e.g. the 70kt estimate), lead to distortion of geo-specific data points, such as yields greater than 100%. Steps should be taken in the analysis to avoid such anomalies; explanation of those steps should be provided for transparency.
- vi. *Implications of the findings.* This should be a discussion of the implications of the key findings in terms of how they shed light on different ways in which future pathways for evolution of the Dutch BC C&R infrastructure may be evaluated.
- vii. *Recommendations.* Two lists of recommendations based on the findings from the pilot study should be presented: firm recommendations and tentative recommendations. The firm recommendations should be ones which are recommendations irrespective of evolutionary pathway options for the C&R infrastructure. For example, one such firm recommendation could be to recommend that labeling on BC's carry an advisory message that it is sufficient for consumers to wash BC's only in cold (rather than hot) water. Tentative recommendations are those which might inform the evaluation of policy making for evolutionary options of C&R infrastructure. The recommendations should also include a summary of further investigations that may usefully be used to provide more in-depth insights into specific aspects of the C&R systems for BC (and related) waste streams than was possible through the six month national pilot.

The main body of the report should make reference to the detailed materials in the appendices. These appendices should be of sufficient transparency, clarity and detail to allow in principle for someone skilled in the art to reproduce a similar pilot study in a further work if necessary. (This comment also applies to report 2).

RECOMMENDATION 2 (Report 2)

The LCA report demonstrates a large amount of work including among other aspects many sensitivity analyses, which is good. It does, however, also show signs of being prepared in a short time due to the time pressure.

This has resulted in a **lack of transparency** on important issues, including:

- The model for the avoided landfill emissions should be clearly stated and reported in a way that allows the reader to understand the calculations
- The model and calculations for the cleaning of the cartons in the household should be presented, and a worst case cleaning illustrated including a pipeloss of hot water for cleaning when turning on the hot tap in the house – just to illustrate the significance of this
- The assumed degree of contamination of the cartons (in terms of kg contaminant COD/kg carton dry matter) should be clearly presented and the best would be to show this for each category of packaged good (yoghurt, pudding, milk, orange juice, etc.) in order to reveal if the contamination implies different optimal pathways for the various types of carton
- The model and calculations of the wastewater treatment should be made more clear
- The model of the waste incineration should be clear including the energy recovery of the contamination COD
- The avoided virgin paper model and calculation should be clear. As it stands now, it says that only Q_{loss} is avoided – at the meeting it became clear through discussions that the model actually calculates the avoided virgin paper as $1 - Q_{\text{loss}}$, which is the right way to do it in the actual case. The text should, therefore, be altered accordingly.
- Biogenic CO_2 emissions were at the meeting claimed not to be included. However, significant avoided GHG emissions are derived from the avoided virgin paper production – these should be tracked to identify their origin.
- The functional unit was somewhat unclear – it should be reported exactly what the 1000 kg of carton refer to – i.e. where in the chain of events and what is included.
- The transparency could be improved with respect to showing the breakdown on contributions. It would be beneficial for the interpretation to be able to see the following individual contributions:
 - The household cleaning (maybe this is already included, but it should, thus, be explained where it is seen)
 - The wastewater treatment
 - The energy recovery (in the MSWI) from the contamination part and the carton separately
 - The benefits from the recovered energy and the recovered materials separately

Inclusion of **biogenic GHG emissions**:

- As mentioned, biogenic GHG emissions are presumably not included. This calls for critique as this topic is one of the most debated issues in any LCA dealing with use of biomass at any point in the system – like the avoided virgin paper in the present system. It is recommended that biogenic emissions are included using e.g. a 20 year as well as a 100 year time horizon for annualizing the net change in carbon stock on the affected land areas in the system. As mentioned at the meeting, there seems to be consensus that the virgin paper marginal moved towards plantation of short rotation plantation like Eucalyptus.

Choice of **marginal supply**:

- In the model of burning RDF in cement kilns, petcoke was assumed as one of the avoided fuel types. We question whether this reflects the resulting consequence of using RDF in cement kilns, as petcoke is a constrained co-product of that it is assumed to always find a use. Rather, hardcoal is assumed to be the resulting market response to using RDF in cement kilns.

Sensitivity analysis:

- When including biogenic GHG emissions from virgin paper, more than one land type should be included. Candidates for hosting a plantation are grassland (today used for animal grazing), savannah in Africa (or similar land types in South America or Asia) and forest land.
- Different carton cleaning behaviors in the household should be shown
- Material recovery of the aluminum and plastic fractions should be included as a supplement to the energy recovery of these fractions
- Future energy systems should be discussed, not least the future electricity and heat grids, which may well entail other marginal supplies 20 years from now, and thus other benefits of displacing electricity and heat should be considered. This could be quantified by assuming other such marginal including being fully or partly derived from renewable energy sources.

Methodology description:

- In the introductory comparison of attributional and consequential LCA approaches, aspects of uncertainty are discussed in a way that seems to suggest that the choice of method can introduce uncertainty. This is not considered to be the case; rather the uncertainty is inherent in the studied system and the decisions to be supported, and the task of the method is to reveal and address the inherent uncertainty with highest possible transparency.
- An important aspect of uncertainty is that the study should aim to reflect environmental aspects of the future, not the past or the present. See the point mentioned about future energy systems above.

Partial analysis – or different references:

- When studying the post-separation scenarios, an issue of comparability arises. If the reference for the post-separation scenario is the MSWI as for the other scenarios, then the comparison of the environmental consequences of the carton flow seen in isolation

becomes quite misleading. The reason is, that if MSWI of the whole MSW stream is the reference, then the post-separation entails so many other changes of the whole MSW flow that it becomes meaningless to compare the two pathways of the cartons seen in isolation

- If, however, the reference for the post-separation of the cartons is that there is already an automated sorting system in place, at which (part of) the carton stream is now also picked out for recycling, then the situation is different. In this case, it does make sense to compare the pathways of the carton flow in isolation from the rest of the MSW flow, but the reference to post-separation for recycling is not MSWI, but an energy recovery of the RDF from this already existing sorting plant. This would make more sense, and imply that the MSWI is only a reference for the separate collection scenarios, whereas the energy recovery from the carton as part of an RDF is the reference for the post-separation scenarios.

RECOMMENDATION 3 (Reports 1 and 2)

It was recommended in the TERC report from the review meeting held on 29th May 2013 that analysis should take a future-oriented perspective that covers several decades (concomitant with infrastructure lifespan). For this reason, it is recommended that the sensitivity analysis be extended to cover cases that go beyond 40% recovery yield, which is unnecessarily restrictive. Specifically, it is recommended that recovery rates of 40%, 60% and 80% are assessed (perhaps including also 50% and 70%). The analysis should be put in context of potential variations in biomass demand, from low- to high-biomass futures, taking into account potential shifts in the future energy system may change in the coming decades as renewable energies play a more prominent role in the overall Dutch energy system

RECOMMENDATION 4 (Reports 1 and 2)

The current text of the draft Report 1 (to be consigned to appendices) should be reviewed closely so that assumptions are properly justified. There are several instances where approximations are justified as being 'plausible' without providing any evidence (e.g. by means of reference) or explanation as to why it should be so. All definitions need to be made rigorous and complete. For example, the definition of functional unit in Report 2 needs to be defined in terms of the nature of the 1000kg of BC to which the definition refers. This recommendation is not a request to extend calculations and configurations to all potential variations and possibilities, but merely to be given sufficient information to the reader so that the report is left with no ambiguities and those practiced in the art (e.g. of performing LCA) can if necessary reproduce the approach and method which has been deployed.

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Prof. H. Wenzel

Dr. M. Gell

3rd December 2013