How the estimates in the 29 September release were built

This note accompanies the press release "Europe's factories pour away up to 40% more food than the EU counts, because the rules assume it can't be measured". It sets out every number in the release, where each input comes from, and the arithmetic, so that the figures can be checked and reproduced. Official figures are cited by source. Collo's estimates are labelled as such.

1. The question and the scope

How much food product leaves EU dairies, breweries, soft-drink and juice plants with their wastewater each year, and how does that compare with the food waste those manufacturers officially report?

Included: liquid product lost to the drain during normal production, chiefly at product changeovers (pushouts), during cleaning-in-place (CIP) rinses, and through early cut-offs and dilution. This is the loss category that Delegated Decision (EU) 2019/1597, Article 1(5)(a), excludes from the EU food-waste measurement.

Excluded: spoiled or recalled product, quality rejects disposed of as solid waste, whey and other by-products, packaging losses, and losses at farm, retail or household level. All of these are either counted elsewhere in the EU statistics or outside the question.

2. The legal basis

- **Directive (EU) 2025/1892**, in force 16 October 2025, amending the Waste Framework Directive. Article 9a: processing and manufacturing must reduce food waste by 10% by 31 December 2030 against the 2021–2023 average; retail and consumption by 30% per capita. Compliance is measured with the EU methodology (Article 9a(2)); the Commission may update the methodology (Article 9a(3)) and must review the targets by 31 December 2027 (Article 9a(8)). Transposition deadline 17 June 2027.
- **Commission Delegated Decision (EU) 2019/1597**, Article 1(5)(a): the measurement "shall not cover … food waste drained as or with wastewater". Article 3(b): reporting it is voluntary. Recital 10 gives the reason: no methods were available to measure it with sufficient confidence and comparability.
- **Commission Implementing Decision (EU) 2019/2000**: the reporting format contains a separate, voluntary column for food waste drained as or with wastewater, outside the headline total.

All three are on EUR-Lex. The Eurostat food-waste statistics (dataset env_wasfw) are compiled under this methodology and therefore exclude drained food by construction.

3. The comparison base: what EU manufacturing reports

- Eurostat, food waste 2023 (published 16 October 2025): 58.2 million tonnes in total, 130 kg per inhabitant; manufacture of food products and beverages 24 kg per inhabitant, 19% of the total. 19% × 58.2 Mt = 11.06 Mt. This is the base used in the release, on which the analysis was built.
- Eurostat, food waste 2024 (published 29 September 2026): around 58 million tonnes, 129 kg per inhabitant; manufacturing 25 kg per inhabitant, about a fifth of the total, so about 11.2 Mt. Per-inhabitant totals have been flat at 128–129 kg across 2020–2024.

On the 2024 base the range in section 5 reads 12–41% instead of 13–42%. The release keeps the 2023 base on which the arithmetic was done; the headline "up to 40% more" holds on either.

4. The inputs: volumes and loss rates

Industry	EU volume	Loss rate	The rate rests on
Dairy	150.8 Mt of milk delivered to dairies, 2024 (Eurostat, apro_mk_pobta)	0.5–2%	JRC reference data (1.9% drinking milk, 0.2% cheese); USDA cheese-plant record (2.35%); Hungarian dairy study (0.9–1%); Collo plant measurements (up to 3%)
Beer	34.4 billion litres, 2025 (BarthHaas Report 2024/25)	1–3%	World Bank Group / IFC, Environmental, Health and Safety Guidelines for Breweries: 1–5% residual beer to effluent; lower bound used
Soft drinks	About 52.6 billion litres, 2024 (UNESDA)	0.5–1%	Assumption, following juice; no published rate. Flagged as such in the release
Juice and nectars	About 7 billion litres (AIJN market report)	0.5–1%	Collo measurement on one European line: 0.6–0.8% of output over two weeks

Loss-rate sources in full: JRC, Best Available Techniques Reference Document for the Food, Drink and Milk Industries (2019), dairy loss rates as cited in a peer-reviewed review of EU dairy wastewater (Journal of Environmental Management, 2021). USDA Agricultural Marketing Service hearing record on cheese-plant BOD losses (2000). Measurement of Food Losses in a Hungarian Dairy Processing Plant, Foods (2021). IFC, EHS Guidelines for Breweries (2007). Collo case studies at collo.fi. One litre is taken as one kilogram throughout; the error for milk (about 1.03 kg/L) and beer (about 1.01 kg/L) is smaller than the rounding.

5. The arithmetic

	Low	High	How
Dairy	0.754 Mt	3.016 Mt	150.8 × 0.5% and × 2%
Beer	0.344 Mt	1.032 Mt	34.4 × 1% and × 3%
Soft drinks	0.263 Mt	0.526 Mt	52.6 × 0.5% and × 1%
Juice	0.035 Mt	0.070 Mt	7 × 0.5% and × 1%
Total	**1.40 Mt**	**4.64 Mt**	**rounded to 1.4–4.6 Mt in the release**
Against 11.06 Mt reported	**+12.6%**	**+42.0%**	**stated as 13% to 42%; "at least a tenth", "possibly more than 40 per cent"**

The range is wide on purpose. It reflects the spread of published loss rates between plants and products rather than uncertainty about any one plant; a plant that measures its own drain loss will fall somewhere inside it.

6. The floor: official figures only

A second, more conservative estimate uses nothing but the Commission's own reference loss rates and Eurostat's product volumes, for two dairy product lines only:

- Drinking milk: 22.5 Mt produced (Eurostat, 2024) × 1.9% (JRC) = 0.43 Mt
- Milk used for cheese: 76.1 Mt (Eurostat, 2024) × 0.2% (JRC) = 0.15 Mt

Total ≈ 0.58 Mt a year, "more than half a billion litres of milk" in the release. Butter, powder, yoghurt, beer and juice are not in this figure. It is the answer to "how do you know": it can be reproduced from two official sources without any Collo data.

7. The conversions used in the release

- **Litres per person:** 1.40–4.64 Mt ÷ 449 million EU residents (Eurostat, 1 January 2024) = 3.1–10.3 kg, stated as "between three and ten litres".
- **Value of the milk:** dairy losses of 0.754–3.016 Mt × €426 per tonne (EU average farm-gate milk price, 42.6 c/kg, EU Milk Market Observatory, May 2026) = €321 million to €1.28 billion, stated as €320 million to €1.3 billion. A floor: processed product is worth more than raw milk, and beer, soft drinks and juice are not valued.
- **Olympic pools (used in charts and social media, not in the release text):** 1.4–4.6 billion litres ÷ 2,500 m³ per 50-metre pool = 560–1,840 pools a year, 1.5 to 5 a day.
- **Greenhouse gases (fact sheet only):** dairy losses of 0.754–3.016 Mt × 1.15 kg CO_2e per kg of raw milk at farm gate = 0.87–3.47 Mt CO_2e, stated as 0.9–3.5 Mt. Beer, soft drinks and juice not included.

8. Plant-level evidence cited

- A European dairy processing 245 million litres a year measured product dilution of 1.3–2.28% of total volume with no alarm raised; a 0.8% timing error per changeover compounded to 7.7% across ten stages. Published Collo case study, anonymised at the customer's request.
- A European dairy cut pushout losses on a single line by 92% and recovers 260,000 litres of product a year. Published Collo case study.
- A European juice line lost 0.6–0.8% of everything it produced over a two-week measurement, and up to 11% on one short run. Collo measurement; used here only as the basis for the juice loss rate.

9. The value of the lost food

Added 7 October 2026. This section puts a euro value on the tonnage in section 5. It values the product at the point where it is lost, at factory gate, before excise, VAT, packaging and retail margin. One litre is taken as one kilogram.

Segment	Tonnage	€ per kg	Unit value and source
Dairy	0.754–3.016 Mt	0.426	EU average farm-gate milk price, 42.6 c/kg (EU Milk Market Observatory, May 2026), as in section 7. Product lost in pushouts and rinses is already processed, so raw milk is a floor.
Beer	0.344–1.032 Mt	0.92	Germany's beer sold production value 2024, €6.6 bn (Eurostat, Key figures on the European food chain 2025, PRODCOM DS-056120), over Germany's 2024 production of 7.2 bn litres (Eurostat, DS-059358).
Soft drinks	0.263–0.526 Mt	0.56	EU soft drinks sold production value 2024, €29.4 bn (Eurostat, Key figures 2025, DS-056120), over 52.6 bn litres (UNESDA). The value excludes countries with confidential data, so this understates the unit value.
Juice and nectars	0.035–0.070 Mt	1.00	Assumption; juice is 2.5% of the tonnage and moves the total by less than €0.1 bn.

	Low tonnage	Mid tonnage	High tonnage
Dairy	€0.32 bn	€0.80 bn	€1.28 bn
Beer	€0.32 bn	€0.63 bn	€0.95 bn
Soft drinks	€0.15 bn	€0.22 bn	€0.29 bn
Juice and nectars	€0.04 bn	€0.05 bn	€0.07 bn
Total	**€0.82 bn**	**€1.71 bn**	**€2.60 bn**

Stated as: about €0.8 to 2.6 billion a year, €1.7 billion on the central estimate. The mid column uses the midpoint of each segment's tonnage range; it is a presentation convenience, not a most-likely value.

Why this is a floor. Valuing the lost milk at the dairy industry's output value per kilogram of milk intake instead (dairy turnover of about €167 bn, 14% of €1,196 bn in 2021, FoodDrinkEurope Data & Trends 2024, over 149.9 Mt delivered to dairies, Eurostat) gives €1.12 per kg, and with beer at the EU-wide ratio (about €1.18 per litre) the range becomes €1.5 to 5.0 billion. The figure also excludes the water, energy and cleaning chemicals lost with the product and the cost of treating it as effluent.

Cross-check. Collo's August 2026 impact model's reference dairy (75 million litres intake) recovers 750,000 litres of product a year: about €320,000 a year at the floor price, about €840,000 at €1.12 per kg. Published Collo per-plant case figures fall in the same range.

10. Limitations

1. The estimate is an order of magnitude, not a measurement. No EU-wide measurement of drained food exists; that absence is the point of the release.
2. Loss rates vary by plant, product and season. The published rates come from a small number of studies and plants; Collo's own measurements cover a limited number of sites.
3. The soft-drinks rate is assumed, not published. Removing soft drinks altogether gives 1.1–4.1 Mt, or 10–37% on the reported base.
4. Volumes are the latest available for each industry and are not all from the same year (dairy 2024, beer 2025, soft drinks 2024).
5. The comparison base (manufacturing food waste) is itself an estimate compiled by member states under the EU methodology, with known differences in coverage between countries.
6. The per-plant sustainability figures used in Collo's other materials (750,000 litres of product, 5,484 m^3 of water and about 920 t CO_2e per reference dairy plant of 75 million litres intake) come from Collo's August 2026 impact model, are modelled rather than measured, and are not used in the release.
7. The value in section 9 depends on the unit value chosen as much as on the tonnage; both are stated. It is not a measurement of any company's losses.

Questions

Jani Puroranta, CEO, Collo · jani.puroranta@collo.fi · +358 50 517 9992. Data tables behind this note are available in spreadsheet form on request.