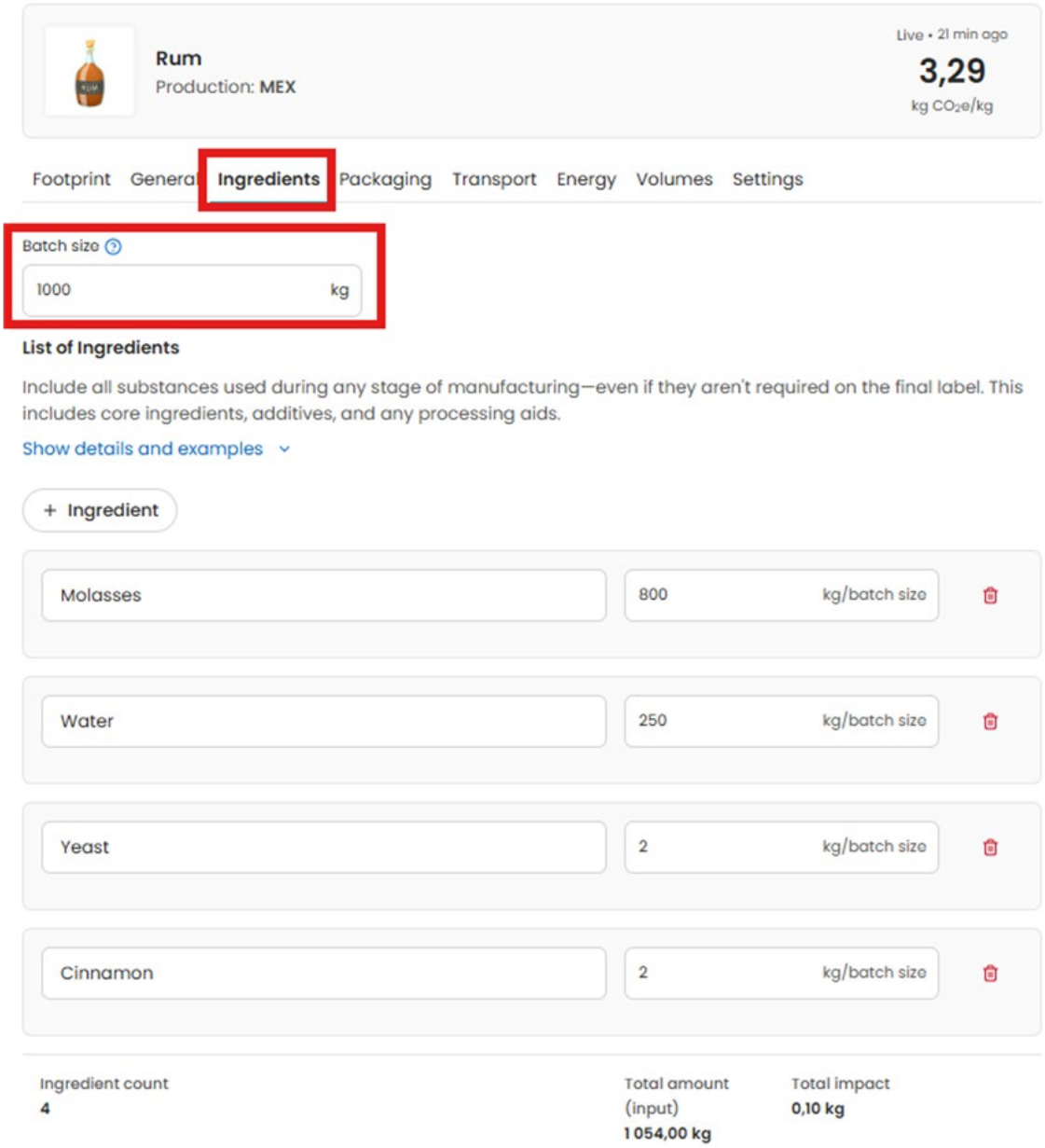
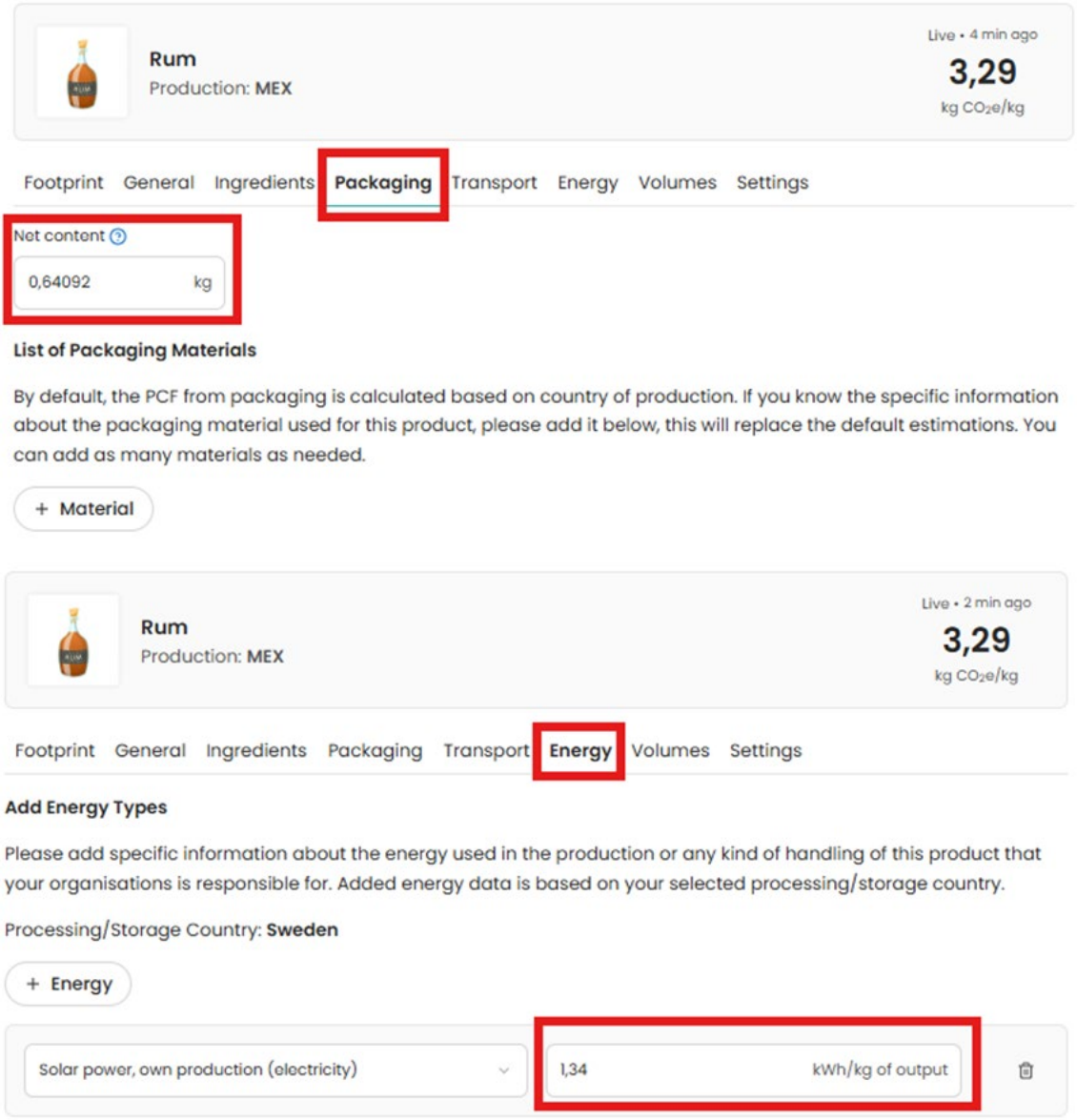
Converting Volume units to Kilograms

CarbonCloud uses **kg** as the functional unit of the product in mind, which for beverage products results in:

- You need to have your **batch size** stated in **kg** to enter **Ingredients** in the CarbonCloud platform.
- You need to have the **net content** of the product stated in **kg** to enter **Packaging** information in the CarbonCloud platform.
- You need to have the final **output** of your product stated in **kg** to enter **Energy** use in the CarbonCloud platform.





To convert an amount stated in **liter** to the corresponding amount stated in **kg** you need to know the **density** of the product in mind.

$$Density = \rho = \frac{m}{V} \rightarrow m = \rho \times V$$

$(m = mass, V = volume)$

How to calculate the density?

c) You know the density of your beverage from internal product information
c) Measure the density with a hydrometer or a refractometer

For a) and b) use the density in Step 4.

c) Calculate the density based on the ABV for the final product

If we go for c)

Step 1: ABV for the beverage

Our rum has 40% ABV, this means:

- 40% ethanol by volume
- 60% water by volume

Step 2: The densities of compontents

- Ethanol density ≈ 0,789 kg/L at 20°C
- Water density ≈ 1,000 kg/L at 20°C

Step 3: Calculate mixture density

$$\rho = (\%_{ethanol} \times \rho_{ethanol}) + (\%_{water} \times \rho_{water})$$
$$\rho = (0{,}40 \times 0{,}789) + (0{,}60 \times 1{,}000)$$
$$\rho = 0{,}9156\ kg/L$$

Step 4: Convert liters to kilograms

If you have 700 ml of rum
$\rho = 0{,}9156\ kg/L$
$m = \rho \times V$
$\boldsymbol{m} = 0{,}9156 \times 0{,}7 = \mathbf{0{,}6409\ \boldsymbol{kg}}$

Other volumes than liter?

1 cubic meter = 1000 liters

1 gallon = 3,78541 liters