

Steps to follow to calculate the nutrient values (NVs) of a single-ingredient recipe

Example: NVs of boiled tomato to be calculated from the NVs of raw tomato. Exemplarily, calculations are presented for the β -carotene equivalent content.

Information available:

Food on which the recipe calculation will be based: 100 g raw tomato

- Yield factor (YF): $YF = 0.8$
- β -carotene equivalents (CARTBEQ) content: $CARTBEQ = 992 \mu\text{g}/100 \text{ g raw tomato}$
- Retention factor (RF) for β -carotene for boiled vegetables: $RF = 0.90$; this RF will be used for CARTBEQ
- Water content: $NV (\text{water}) = 93.0 \text{ g}/100 \text{ g raw tomato}$

STEP 1:

Take the nutrient values of 100 g raw tomato of the reference database.

STEP 2:

Calculate the cooked weight based on the raw weight using the formula:

$$\text{Weight (cooked)} = \text{weight (raw)} \times YF$$

Example: $100 \text{ g} \times 0.8 = 80 \text{ g}$ of boiled tomato

STEP 3:

Per nutrient, calculate the nutrient content for 80 g boiled tomato.

$$NV \text{ of } 80 \text{ g boiled tomato} = NV \text{ of } 100 \text{ g raw tomato} \times RF$$

Example: $992 \mu\text{g} \times 0.90 = 893 \mu\text{g}$ CARTBEQ per 80 g boiled tomato



Remember that the estimated nutrient value of the prepared food, calculated using a retention factor, refers to the weight after preparation.

STEP 4:

Per nutrient, calculate the nutrient value per 100 g cooked food.

$$\text{NV of 100 g boiled tomato} = \frac{\text{NV of 80 g boiled tomato}}{\text{weight of boiled tomato (80 g)}} \times 100$$

Example:

$$\frac{893 \mu\text{g CARTBEQ per 80 g boiled tomato}}{80} \times 100 = 1116 \mu\text{g CARTBEQ per 100 g boiled tomato}$$

We need to divide by 80 to come to 'NV per g boiled tomato', and when we then multiply by 100 we obtain 'NV per 100 g boiled tomato'.

STEP 5:

To obtain a complete nutrient profile, repeat steps 3 and 4 for all nutrients except water and the conversion factors (XN, XFA).

The water content is calculated through a specific formula (see step 6).

Simply copy the conversion factors as they do not change through cooking: take the value of XN (nitrogen-to-protein conversion factor) and XFA (fatty acid conversion factor) of raw tomato for boiled tomato.

STEP 6:

Calculate the water content according to the formula (Food Standards Agency, 2002):

$$\text{Water content of cooked dish per 100 g} = \frac{\text{Water in raw ingredients} - \text{weight loss on cooking}}{\text{Weight of cooked dish}} \times 100$$

Where: weight loss on cooking = weight of raw ingredients – weight of cooked dish

Example: 100 g raw tomato have 93.0 g water. When boiling, 20 g food were lost (indicated through the YF of 0.80) which is assumed to be all water.

$$\frac{93.0 - (100 - 80)}{80} \times 100 = 91.25 \text{ rounded to } 91.3 \text{ g water per 100 g boiled tomato}$$

Note that water should be displayed with 1 decimal place only, therefore the result needs to be rounded.

STEP 7:

Now check all your calculations and formulas again. If you use a software or Excel, check that:

- formulas are correct and refer to the correct cells (to the NVs per 100 g ingredient and the corresponding yield and retention factor);
- the NV of water was calculated according to its specific formula and the conversion factors were copied from the raw food; and
- no zero values were created by the system if there were no nutrient values for the raw food.

STEP 8:

Document and enter the nutrient values of the cooked food into the reference database (if the calculations were performed outside the reference database).

If you wish to carry out a real-life calculation of the nutrient values of boiled tomato using a simple software application (the [FAO/INFOODS Compilation Tool](#)), do exercise VIII.E3 of the [Food Composition Study Guide](#).

Source:

Food Standards Agency (2002) McCance and Widdowson's The Composition of Foods (6th Summary Edition), Royal Society of Chemistry, Cambridge.