

## Questions & Answers - Webinar Sustainable Diets

12 March 2019

- 1. What factors were considered in penalty points for the various diet types? E.g. the vegan diet was 30% lower in impacts but there was an alternative diet that was also 30% lower in impacts that was easier to adopt. Can you tell me how you calculated that please?**

The vegan diet is a diet without animal products. We've optimized a vegan diet, starting with the reference diet. So, the calculated vegan diet complies to all the nutritional constraints. It is however quite difficult to adopt, which is reflected by the Euclidian distance. The Euclidian distance is the shortest linear distance between the two diets within a multi-dimensional space (On a map: straight line between two cities, whereas the penalty could represent the fastest route between both or the most scenic, depending on which property you select). The vegan diet is a scenic route, but there is a faster one. This is a diet which decreases the impact like the vegan diet but does not require the same amount of changes. This means that it will be easier to adopt by the general population. The composition of the two diets is different, but the reduction in impact is the same.

- 2. In the example of increasing wheat bread: How does an increase of its use decrease the carbon footprint and eutrophication? I assume it must be displacing something otherwise an increase in use would increase the carbon footprint.**

In the analysis we've deliberately increased the consumption of wheat bread, in steps. At every increase, so at every step, Optimeal checks the compliance to the constraints. If the constraints are not met, an optimization is run. As a result of the optimization the amounts of products in the diet shift. They are increased, decreased, taken up or eliminated completely. This means that besides the deliberate change in consumption of wheat bread, also the consumption of other products changes. The overall impact on climate change (and other impact categories) of the diet however decreases when more wheat bread is consumed. The reason is that wheat bread delivers quite relevant nutrients with a relatively low environmental impact. It has a good balance between the provided nutrition and the environmental cost.

- 3. Can you let me know which are the 8 impact properties that you report in Optimeal?**

There is a methodology report that comes with the EU dataset and it is available [online](#). The environmental properties of products are important for determining the environmental sustainability of a diet. Environmental properties of all the products in the reference diet are determined using the LCA methodology. This methodology captures the impact of a product (or service) through-out its life cycle. The list of impact categories assessed for the EU Optimeal dataset are listed on the next page:

Impact category	unit
Global warming - excl LUC	kg CO <sub>2</sub> eq
Fine particulate matter formation	kg PM <sub>2.5</sub> eq
Terrestrial acidification	kg SO <sub>2</sub> eq
Freshwater eutrophication	kg P eq
Marine eutrophication	kg N eq
Land use	m <sup>2</sup> a crop eq
Fossil resource scarcity	kg oil eq
Water consumption	m <sup>3</sup>

The system boundary in this database is defined as from Farm-to-Fork, including all activities taking place at the farm (cultivation or husbandry), all the way through processing, retail and consumption. The LCAs carried out for Optimeal are in line with the ISO 14040/44 series (ISO, 2006a, 2006b). For the life cycle stages from processing to plate the Product Environmental Footprint (PEF) guidance (European Commission, 2017) and PEF default data have been used.

#### 4. Can Optimeal simply display the environmental footprint of one or various meals? So without optimization?

The environmental impact of all the food products is displayed in the food products tab. As you can see in the screenshot below, almonds have an impact on global warming of 0.57 kg CO<sub>2</sub>eq per 100g.

Enabled	Name	Global warming - excl LUC kg CO <sub>2</sub> eq in 100g product
<input checked="" type="checkbox"/>	Almond, sweet	0.57 kg CO <sub>2</sub> eq
<input checked="" type="checkbox"/>	Apple	0.0307 kg CO <sub>2</sub> eq
<input checked="" type="checkbox"/>	Bacon	1.56 kg CO <sub>2</sub> eq
<input checked="" type="checkbox"/>	Bananas	0.0588 kg CO <sub>2</sub> eq
<input checked="" type="checkbox"/>	Beans	0.188 kg CO <sub>2</sub> eq
<input checked="" type="checkbox"/>	Beans, green, without pods	0.229 kg CO <sub>2</sub> eq
<input checked="" type="checkbox"/>	Beans, with pods	0.173 kg CO <sub>2</sub> eq
<input checked="" type="checkbox"/>	Beef meat	4.45 kg CO <sub>2</sub> eq
<input checked="" type="checkbox"/>	Beer and beer-like beverages	0.127 kg CO <sub>2</sub> eq

It is also possible to view the impact of the total diet. For this you would need to go to the properties tab, as displayed below:

Enabled	Name	Property constraints		Reference diet
		Minimum per day	Maximum per day	Reference diet per day
<input checked="" type="checkbox"/>	Freshwater eutrophication	0	0	0.00131 kg P eq
<input checked="" type="checkbox"/>	Global warming - excl LUC	0	0	5.47 kg CO <sub>2</sub> eq

You can see that the impact of the EU diet on global warming is approximately 5.5 kg CO<sub>2</sub>eq per person per day.

The EU dataset is the default dataset which comes with the Optimeal license. But you can alter any of the data in the dataset. You can even build your own dataset to fit the needs and requirements of your analysis.

**5. Why is cheese not part of the protein product group? (sheet 18)**

There is protein in many products. The Eat-Lancet Commission has chosen to categorize their products this way. There are many variations to this categorization.

**6. Are the nutritional differences between animal or plant protein available in the Optimeal database?**

The amino acids profile is relevant when considering protein quality and the differences between animal and plant protein. 9 relevant and essential amino acids are part of the EU dataset, as a nutritional property. This means that you will be able to define lower and upper boundaries on the level of amino acids. This will make sure that the optimized diet contains all the amino acids in the right amount.

**7. How did you come up with the calorie distribution map (that concluded that there will be still a lack of calories, even with even distribution).**

This has been calculated by [WRI](#), based on FAO and UNDESA.