

What is the target for running a scenario?

The goal for any scenario of the global food system should be to meet the target intake for all nutrients in the DELTA Model, shown as the black bar on the nutrient supply charts.

The DELTA Model assumes even distribution of food commodities among the global population. In reality, food is not evenly distributed globally. In addition, adverse events such as droughts or floods can affect food production and distribution. Therefore, to account for this, nutrient supply per person per day should be slightly above the target intake.

What does food waste include?

Supply chain waste represents losses that occur from farmgate to retail. In-home waste is food waste that occurs in home by consumers. Inedible material in food used (e.g. inedible fruit and vegetable material skins) is not included in food waste; the DELTA Model calculates this inedible portion separately. Any mass that does not leave the farm is not counted as food supply, so cereal stalks and husks that are left behind are not included as food waste.

What does food production include?

Food production in the DELTA Model includes all biomass that leaves the world's farms that enters the food system. Some of this will go to human consumption, while some will be used as animal feed or for other uses, and some will be wasted. Synthetic or non-food sources of nutrition (e.g. fermentation produced protein and mined minerals) are not included.

Does nutrient provision account for losses of bioavailability during cooking?

No. The model assumes that all bioavailable nutrients in food consumed are in raw form. The reality is that food can be prepared and consumed in many different ways, affecting nutrient composition and bioavailability. However, the complexity of modelling this would bring a significant margin of error into the model. Therefore, the DELTA Model assumes that all bioavailable nutrients in the raw commodity end up in the food consumed.

Does the model run optimisations to generate one right answer?

The purpose of the DELTA Model is to not be constrained to one perfect answer, but rather to generate scenarios about possible food production scenarios, in order to generate informed discussion and expand thinking. As such, the model does not calculate one right answer.

Are environmental footprints included in the DELTA Model?

As of version 2.0, cropland use is included in the DELTA Model as the first aspect of environmental sustainability to be modelled. Environmental sustainability is a key part of a sustainable food system but a broad quality. As such, resource footprints (greenhouse gas, total land and water) should be considered by the user when evaluating future possible food systems. Other aspects of environmental sustainability are targets for future model development.

Can input data be selected by country?

As of version 1.3, the DELTA Model allows the user to investigate national nutrient dynamics in 2015 under the Helpful tab. However, there is no functionality for DELTA Model scenarios at the national level.

How is transport/supply chain to get food from production to mouth factored?

The DELTA Model uses the FAO food balance sheets, which encompass the entire supply chain from farm gate to retail, capturing losses and distribution into different uses. Since environmental

footprints are not yet included in the model due to data issues, this aspect of transport and supply chain is not yet included in the model. Indeed, the complexity of the global supply chain is one of the main reasons why many of the environmental impacts of a DELTA Model scenario are not yet estimated in the model.

Does the model address the uneven distribution of food and nutrients globally?

As of version 1.3, the DELTA Model displays the inequitable distribution of nutrients between different countries in 2015. However, there is no scope to use DELTA Model scenarios to investigate this distribution in the future. The focus of the DELTA model is on the global food production required to meet global nutrient requirements. When running various scenarios in the DELTA Model, a slight over-production of all nutrients should be the target, to act as a buffer to account for the uneven distribution of food and nutrients globally.

What is the difference between global demand and nutrition required?

Demand is the quantity of food global consumers are willing and able to purchase. Nutrition required is based on the target intakes of each nutrient for the global population. For example, while demand may be increasing for protein, the DELTA Model shows that there is already sufficient protein to meet global nutrient requirements.

What is the difference between reference diet adjustment and bioavailability adjustment?

The reference diet selection has the options: base, vegetarian and vegan. Selecting the vegetarian or vegan diets increases the target intake values for iron and zinc, to account for lower bioavailability of these minerals in high plant diets. Because there is insufficient data on the bioavailability of these nutrients in all foods, the target intake increases to account for the fact that a higher iron intake is recommended to meet requirements in a vegan or vegetarian diet compared to an omnivorous diet.

Contrastingly, there is sufficient scientific data on the bioavailability of essential amino acids from different protein sources. The DELTA Model adjusts for this bioavailability unless the relevant checkbox is selected.

How were the default scenarios created?

The default scenarios (e.g. 2030 Vegetarian, 2030 Scale-up Current) are rough estimates of what the given scenario might look like in terms of food production. These are intended as starting points for the user to explore from, rather than predictions based on food system forecasts.

For example, the 2030 Vegetarian scenario has zero meat and seafood production and uses the 2030 forecast population. This represents a possible food system scenario that the user can then adjust to explore nutritional outcomes.

Does the DELTA Model dictate an individual diet?

No. The purpose of the DELTA Model is to explore the ability of different food production scenarios to provide the bioavailable nutrients needed to adequately feed the global population. It does not try to provide the answer to sustainable diets for individuals.

How do I use the Nutrient Density tool to identify which foods to build up in the food system?

To build an efficient food system it is useful to start with nutrient-rich foods, particularly those rich in limiting nutrients. The nutrient density chart is a tool to discover which foods are rich in specific nutrients. Production of these foods can be increased in a scenario to ensure nutrient requirements are met.

By navigating to 'Helpful' and selecting 'Nutrient Density', two charts will appear side by side. The nutrient density chart is on the left, and a chart showing food use of the item is on the right. The purpose of the food usage chart is to help identify which foods are realistically able to contribute to nutrient supply. Foods that have high nutrient density, and also relatively high food use have good practical potential to contribute to global provision of that nutrient.

The target nutrient can be changed to view the nutrient of interest using the drop-down box. This nutrient can then be constrained against a number of different parameters. Mass is the default dietary constraint, but this can be changed depending on what the limiting factor is in the scenario.

Are synthetic nutrients included in the DELTA model?

No. Synthetic nutrients, such as fermentation produced protein or mined minerals, are not included. To include synthetic nutrients, accurate data is required on their production. For example, accurate data would be required on the biomass feed required to obtain a certain amount of protein via fermentation, which is not yet available.

What does the Nutrient Contribution Score mean?

The Nutrition Contribution Score is a metric to give a sense of how valuable each food item is in terms of its nutritional contribution to the global food system. The DELTA Model calculates this score for each food item by taking the proportion of each nutrient (e.g. Calcium, Vitamin A) supplied by the food item (e.g. Apples, Bananas), and then summing these for all nutrients. Energy and carbohydrates are excluded from the calculation, as a high contribution to these values is not necessarily beneficial to the global population.