

# Release notes for DELTA version 1.3

## Summary

DELTA Model 1.3 (released online 22<sup>nd</sup> April 2021) features a new splash page and the addition of new views on nutrient availability at a national, sub-regional and regional level. This includes domestic production of nutrients, import and export dynamics, and domestic availability as food. These new views allow users to investigate the variation in nutrient availability between countries.

Other minor alterations and additions have been made. There is now a page showing the allocation of co-products of primary food commodities calculated in the model, and processing links and yields between primary food commodities and their processed products.

The processing links for certain oil crops in the FAO data used by the model was found to include errors. This misallocation was resulting in too great a production of 'Oilcrops, Other'. Most notably, the correction has resulted in a decrease in the size of the Vitamin E nutrient gap in the baseline (from 31% to 19%) and other scenarios. No other substantial changes to results have been identified.

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## New splash page

On opening the model, the user is now greeted with a splash page identifying the global nutritional challenge that the DELTA Model was designed to study. The chart on the right (also available under Helpful: Nutrient Distribution: Nutrient Variation) captures the global average availability of nutrients, as well as how greatly this varies between countries.

## Addition of nutrient trade

### Helpful: Nutrient Distribution: Nutrient Movement

The Nutrient Movement page allows you to see how nutrients (rather than foods) were traded between countries in 2015. Select a country and nutrient of interest using the dropdown boxes on the left-hand side of the page. Three charts for this nutrient are shown on the right-hand side.

The first chart shows the production, trade and domestic availability of that nutrient, on a per capita per day basis. For example, when averaged out to per capita per day units, Algeria produces around 1200 kcal of food energy. This is largely from plant sources, as shown by the colour coding. Algeria imports around 2100 kcal and exports a small amount. The 'Eaten' bar on the chart gives the result of the equation:  $\text{Produced} + \text{Imported} - \text{Exported}$ , thus the availability of food energy domestically. Identically to the other DELTA Model charts, the horizontal black line on the 'Eaten' bar shows the target daily per capita intake for the average Algerian, and the range bars show the safe upper and lower limits. The dashed line shows the global average availability of food energy.

The second and third charts on this page show the same information as the first, but for firstly the sub-region, and then the region. This can show the variation between an individual country and its neighbours. For example, energy availability in Algeria is above the global average (dashed line), whereas the average availability for Africa is below the global average.

Below the charts is the population of the country, sub-region or region to which the chart pertains. The food production and trade of several countries are not accounted for in the FAO food balance sheets, and thus not accounted for in the DELTA Model. These countries, and their populations, are noted in the tables below the charts.

Finally, there is a tick box on the left-hand side labelled 'Show all trade nutrient flows'. The default setting shows all flows, both in and out, for each food group. If unchecked, the charts show net flows instead.

### **Helpful: Nutrient Distribution: Nutrient Variation**

The Nutrient Variation page shows a single chart. This chart shows the availability of all nutrients considered by the DELTA Model as a proportion of the target intake for that nutrient. The coloured bars show the global average, while the range bars show the 10<sup>th</sup> and 90<sup>th</sup> percentiles, i.e. the range of nutrient availability in different countries. The bars are colour coded by the position of the global average availability compared to requirement: red for below, amber for just above, and green for substantially above.

A key takeaway from this chart is that even for nutrients coloured green, such as Vitamin C, the variation in availability of this nutrient means that availability in many countries is below the requirement.

### **Model structure page**

A new tab under helpful has been added: Model Structure. The Composition Model page from DELTA 1.2 is now found here. Additionally, another page has been added: Food Item Linkages.

The Food Item Linkages page displays two data tables. The first details the co-products of primary production that are considered by the model. For example, the DELTA Model includes 0.14 tonnes of edible bovine offals for every tonne of bovine meat entered as primary production.

The second table details the links between primary food commodities and their processed products. For example, 21% of the 'Apples and products' allocated to processing are used for Cider Brewing. Of this amount, there is a 50% yield of 'Beverages, Fermented'. The other processing paths for the remainder of the processed 'Apples and products' are also shown. Similarly, 100% of the processing allocation of 'Barley and products' is used for Beer Brewing, with a 484% yield of 'Beer'. This high mass yield is due to the addition of water.

### **Calculation methodology for new features**

The Nutrient Movement and Nutrient Distribution pages combine information from the 2015 Food Balance Sheets (FBS) with the in-home loss, inedible portion, and nutrient composition

components of DELTA to provide insights on the level of nutrition available in different countries and regions.

The starting point for the Nutrient Movement chart is a country level view of the FBS, after applying corrections for known errors in the data. The individual country ratio of Food to Domestic Supply Quantity for each food item is used to estimate the portion of the Production, Import and Export volumes that would end up as food (as opposed to feed, losses, or other non-food uses) if they remained in the specified country. This is then further adjusted by the level of in-home waste and inedible portions of the commodities before applying the food composition data to determine the nutrient content at a food item level. This is then divided by the population of the country to obtain per capita nutrient flows. The nutrient requirements are calculated at a country level by applying the DELTA nutrient intake targets to the 2015 demographics of the country. The nutrient flows are then aggregated to the level of the major food classes (Dairy, Eggs, Fish, Meat and Plant) and presented as a waterfall chart in the model. Similar calculations are used at a sub-regional and regional level.

The Nutrient Distribution page uses the country level Food allocations from the FBS and applies the same corrections as above to determine the amount of each nutrient available to the average citizen of each country. These values are then combined into an ordered series and the average, 10th and 90th percentiles by cumulative population extracted. These are normalised against the DELTA global nutrient intake target to provide the data for the chart – assuming perfect and equitable distribution of nutrients within each country.