

Bean Facts – technical note

Analysis of the GBD dataset to calculate premature deaths linked to diets low in legumes

We used the Global Burden of Disease 2021 dataset provided by the Institute for Health Metrics and Evaluation.

The Global Burden of Disease (GBD) study assesses mortality and disability from hundreds of diseases, injuries, and risk factors around the world.

The GBD Results tool allows you to download estimates from the study, including causes of death, diseases and risk factors with subnational estimates for 21 different countries including the UK.

We used the GBD tool to look at the number of deaths by all causes in the UK associated with diets low in legumes. We then selected the upper estimated value for this.

Analysis of the NDNS for bean consumption trends

The UK National Diet and Nutrition Survey (NDNS) from 2019 to 2023 (waves 12-15) served as the basis for all analyses conducted. This survey includes consumption data from a nationally representative sample of 4,089 individuals aged 1 to 85 years across the UK.

One portion of beans for those aged 11 and over is 80g based on the recommended 400g a day of fruit and veg. For our calculations, we have used a portion size of 50g for children aged 10 and under. This is the midpoint value of the 40-60g recommended for children aged 4-10 years old in the School Food Plan and consistent with previous Food Foundation analysis of children's fruit and vegetable intake. Both children and adult's intake have therefore been included in calculating the average number of portions for the devolved nations, for different income terciles and sex and ethnic groups.

Survey weights were applied to quantify the number of individuals, food intakes, and statistical differences across various sociodemographic groups (e.g., males versus females).

The Usual Intakes, as reported in the Person-level NDNS data, were used to calculate the average consumption of beans across these sociodemographic groups. NDNS waves 12-15 included Usual Intake variables for the first time, which we have used here instead of day average intake. When calculating the day-average for nutrient and food intakes, the variance of the usual group intake is inflated by day-to-day

variation in individual intake, resulting in inflated estimates of the prevalence of low or high intakes. This is avoided by calculating the Usual intake, which is the gold standard for dietary recall data as they allow data from non-consecutive days to be tracked - thus avoiding the so-called 'weekend effect' and providing a more accurate picture of consumption over time. We used usual intakes to calculate the average consumption of beans across different sociodemographic groups.

The analysis of NDNS data for consumption encompasses all items classified as beans by the NDNS. This includes soybeans in soymilk as well as in food dishes. The NDNS definition of beans excludes peanuts and green peas, which have therefore **NOT** been included in our consumption analysis. We also excluded pea and soy isolates.

When identifying the most popular beans and bean-containing dishes, only foods highlighted by the Food Foundation for inclusion were considered (excluding plant-based milks and soy beans in sauces, for instance); thus, the Food-level NDNS data was utilised for this analysis.

In the results for most commonly eaten beans, it is only the haricot bean (no tomato sauce) that has been considered. However, in the calculations for the most popular bean dishes, we have included the tomato sauce in baked beans in weight calculations.

Non-consumers were defined in two ways: first, as individuals consuming 0 grams of beans, and second, as those consuming fewer than one portion (80 grams for adults and 50 grams for children) of beans per week. The latter definition was used for further analyses due to the low proportion of individuals consuming 0 grams of beans (<5%).

Beans in composite dishes (e.g., chickpeas in hummus) were included in the analyses. Similar food items (e.g. "baked beans" and "baked beans, reduced sugar", were grouped for the estimation of top 10 beans/top 5 bean-containing dishes.

Chi-square tests assessed associations between consumer and non-consumer status (defined as consuming fewer than one portion per week) and various sociodemographic groups. Logistic regression was employed to determine which sociodemographic groups had lower or higher odds of being classified as non-consumers.

Reference intakes for potassium, iron, zinc, and magnesium used in Part Four of Bean Facts to calculate the proportion of adults and children falling under the LNRI were derived from Public Health England.¹

Analysis of trade data

Trade data was obtained from the United Nations (UN) Comtrade database. Data was pulled from the years 2023 and 2024. The 2024 data was used for analysing imports, exports and trade deficit. The following HS codes were downloaded, and given a simplified name:

HS code	HS code name	Simplified name
070810	Vegetables, leguminous; peas (<i>pisum sativum</i>), shelled or unshelled, fresh or chilled	Fresh peas
070820	Vegetables, leguminous; beans (<i>vigna</i> spp., <i>phaseolus</i> spp.), shelled or unshelled, fresh or chilled	Fresh beans
070890	Fresh legumes (other than peas and beans)	Fresh legumes (other than peas and beans)
071021	Vegetables, leguminous; peas (<i>pisum sativum</i>), shelled or unshelled, uncooked or cooked by steaming or boiling in water, frozen	Frozen Peas
071022	Vegetables, leguminous; beans (<i>vigna</i> spp., <i>phaseolus</i> spp.), shelled or unshelled, uncooked or cooked by steaming or boiling in water, frozen	Frozen beans
071029	Vegetables, leguminous; (other than peas or beans), shelled or unshelled, uncooked or cooked by steaming or boiling in water, frozen	Other frozen legumes
071310	Vegetables, leguminous; peas (<i>pisum sativum</i>), shelled, whether or not skinned or split, dried	Peas (dried)
071320	Vegetables, leguminous; chickpeas (<i>garbanzos</i>), shelled, whether or not skinned or split, dried	Chickpeas (dried)
071331	Vegetables, leguminous; beans of the species <i>vigna mungo</i> (l.) hepper or <i>vigna radiata</i> (l.) wilczek, shelled, whether or not skinned or split, dried	Black gram or green gram (mung bean) (dried)
071332	Vegetables, leguminous; small red (<i>adzuki</i>) beans (<i>phaseolus</i> or <i>vigna angularis</i>), shelled, whether or not skinned or split, dried	Adzuki beans (dried)

¹ Government Dietary Recommendations Government recommendations for energy and nutrients for males and females aged 1 – 18 years and 19+ years

071333	Vegetables, leguminous; kidney beans, including white pea beans (<i>phaseolus vulgaris</i>), shelled, whether or not skinned or split, dried	Kidney beans and haricot beans (dried)
071334	Vegetables, leguminous; bambara beans (<i>Vigna subterranea</i> or <i>Voandzeia subterranea</i>), shelled, whether or not skinned or split, dried	Bambara Beans (dried)
071335	Vegetables, leguminous; cow peas (<i>Vigna unguiculata</i>), shelled, whether or not skinned or split, dried	Cow peas (dried)
71339	Vegetables, leguminous; n.e.c. in item no. 0713.3, shelled, whether or not skinned or split, dried	Other legumes, e.g. guar (dried)
071340	Vegetables, leguminous; lentils, shelled, whether or not skinned or split, dried	Lentils (dried)
071350	Vegetables, leguminous; broad beans (<i>vicia faba</i> var. major) and horse beans (<i>vicia faba</i> var. equina, <i>vicia faba</i> var. minor), shelled, whether or not skinned or split, dried	Faba beans (dried)
071360	Vegetables, leguminous; pigeon peas (<i>Cajanus cajan</i>), shelled, whether or not skinned or split, dried	Pigeon peas (dried)
71390	Vegetables, leguminous; n.e.c. in heading no. 0713, shelled, whether or not skinned or split, dried	Other legumes, e.g. n.e.c. lentils (dried)
121292	Locust beans (carob); fit for human consumption, fresh, chilled, frozen or dried, whether or not ground	Locust (carob) beans
200551	Vegetable preparations; beans, shelled, prepared or preserved otherwise than by vinegar or acetic acid, not frozen	Preperared or preserved beans (shelled)
200559	Vegetable preparations; beans, (not shelled), prepared or preserved otherwise than by vinegar or acetic acid, not frozen	Preperared or preserved beans (unshelled)
110610	Flour, meal and powder; of the dried leguminous vegetables of heading no. 0713	Bean flours, excl. soy (e.g. chickpea flour)
130232	Mucilages and thickeners; whether or not modified, derived from locust beans, locust bean seeds or guar seeds	Bean-derived thickeners (e.g. guar gum)

The trade data was filtered to remove 'World' as a partner and converted from kilograms to tonnes. No conversion factors were applied to data, and as such a data caveat is that the tonnage includes some packaging weight, for example tins, for HS codes 200551 and 200559.

Analysis of production data

Production data was obtained from DEFRA. Data was collected for the years 2020-2024, to allow a year-on-year trend analysis using 5 data readings. The following bean and legume categories were reported by DEFRA:

- Faba beans
- Peas for animal consumption
- Peas for human consumption