

Energy Density



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On average, most people eat roughly the same weight and volume of food each day – around 1.8 kg, or 4 pounds.

The key to maintaining a healthy weight is therefore **less** about eating smaller amounts of food, and **more** about choosing **nutritious foods that provide fewer calories for the same volume.**



Energy density (also called calorie density) can be a useful tool for maintaining a healthy weight or for supporting sustainable weight loss. Many people associate weight loss with tiny portion sizes and constant hunger. However, by choosing foods that are lower in energy density, it is possible to **eat larger, more satisfying meals** that promote fullness while naturally reducing one's overall calorie intake.

What Is Energy Density?

Energy density refers to the **number of calories** (kcal) per gram of food.

Low energy-dense foods provide fewer calories per gram, allowing **larger portion sizes** for fewer calories.

eg. apple

*70
calories



*approximately

High energy-dense foods provide more calories contained in a **smaller amount** of food.

eg. doughnut

*400
calories



People tend to feel full based on the **volume** of food they eat rather than the **number of calories** consumed.

This means that eating **larger portions** of foods low in calorie density can help promote **fullness** while keeping the **overall calorie intake** low.

Therefore, focusing on **low calorie-dense foods** allows for **larger portions, greater satiety,** and **better nutrient intake** without excess calories.

How to Reduce the Energy Density of Your Diet

The energy density of a meal depends on the **balance of nutrients** and the amount of **water** and **fibre** it contains. Foods that are naturally lower in energy density tend to be higher in water and fibre and lower in **fat**, allowing you to eat a **larger volume** for **fewer calories.**

It can be useful to understand the energy density of particular macronutrients to know how this influences the overall diet:

Foods higher in fat are more calorie-dense, and consuming alcohol adds extra calories.

Carbohydrate 4kcal

Protein 4kcal

Alcohol 7 kcal

Fat 9 kcal

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Foods that are Low in Energy Density

Fruits and vegetables



Naturally low in calories and high in water, fibre, vitamins, and minerals. Aim for a variety of colours and types daily.

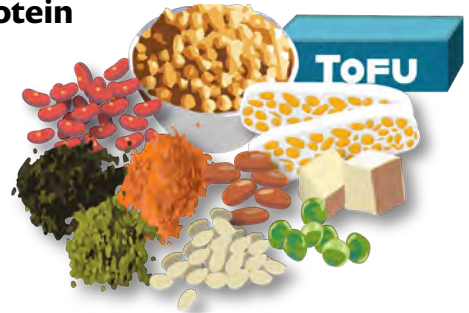
Whole grains

Brown rice, oats, quinoa, and wholemeal pasta provide long-lasting energy and are more nutrient-dense than refined grains. Foods such as pasta and rice also absorb water while cooking, adding bulk to the meal without adding calories.



Pulses (beans, lentils, chickpeas), and other plant protein

Plant proteins such as beans, lentils and soya products can increase fullness and help us feel satiated after a meal. They are excellent sources of fibre and can help stabilise blood sugar and keep you full.



Dairy alternatives

Unsweetened soya milk and soya yoghurt are lower in calories than full-fat dairy while providing protein and essential nutrients.

Check that it's fortified with calcium, vitamin D and iodine.



Foods that are High in Energy Density

These foods contain more calories per gram, often due to higher fat or sugar content, and limited fibre. They are also easier to overconsume in large portions.



Fatty meats

Sweets, cakes, and pastries



Higher fat dairy and butter



Fried and heavily processed foods

Swapping out these foods for lower energy dense options helps manage overall calorie intake.

Healthy Foods that are Energy Dense

Some energy-dense foods are nutritious and play an important role in a balanced diet. These foods provide essential unsaturated fats and other nutrients and should be included mindfully, considering standard portion sizes.



Nuts, nut butters and seeds

Oils for cooking and drizzling:

Extra virgin olive oil and other plant-based cooking oils such as rapeseed oils.



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Practical Tips for Lowering Energy Density

Build main meals around plant proteins such as lentils, beans, chickpeas, tofu and tempeh. These foods are rich in protein and fibre, lower in energy density than many other protein sources, and help increase satiety, as higher protein intakes are known to promote feelings of fullness.

Chickpea Caesar salad



Examples:

Lentil bolognese



Scrambled tofu



Coronation chickpea sandwich filling



Daal



1. Fill at least half your plate with fruits and vegetables

Focus on eating plenty of **non-starchy vegetables**, these are vegetables that are **low in carbohydrate and calories** but **high in water and fibre**, such as **leafy greens, broccoli, cauliflower, peppers, courgette, and mushrooms**.



3.

Use cooking methods that rely less on added fat, such as **boiling, steaming, and grilling**.

2. Continue to consume healthy energy-dense foods such as nuts and seeds, but be mindful of portion sizes.

For example, the recommended portion size for nuts and nut butters is **30g**, which equates to **one handful** or **tablespoon**.



4.

When cooking with fat, **avoid adding too much** by **measuring out the portion size**.



Measuring out portion sizes can help to **avoid adding more calories** accidentally. One tablespoon of oil has **120 calories**.

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Energy-Density Meal Swaps

Below are examples of high energy-density meals and lower energy-density swaps. The lower energy-density options provide larger portions for fewer calories, as they contain **more fibre, more water, and a wider variety of healthy plant-based foods.**

Higher energy dense:

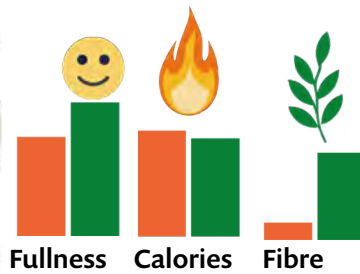
Quick breakfast

Lower energy dense:



230g
245 calories
1g fibre

Supermarket cereal with whole dairy milk



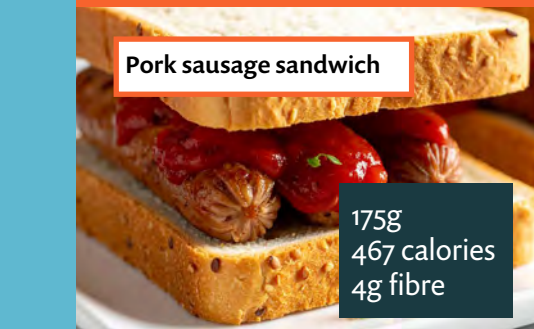
310g
227 calories
5g fibre

Overnight oats with soya milk and blueberries

Higher energy dense:

Cooked breakfast

Lower energy dense:



Pork sausage sandwich

175g
467 calories
4g fibre



Scrambled tofu with tomatoes and spinach on a slice of wholemeal bread, with 1/2 tbsp oil

259g
263 calories
5g fibre

Higher energy dense:

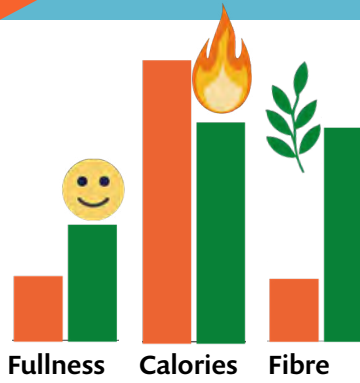
Lunch

Lower energy dense:



Cheese and pickle sandwich with a bag of crisps

185g
583 calories
3.5g fibre



Chickpea salad with carrots sticks and hummus

330g
455 calories
11.9g fibre

Higher energy dense:

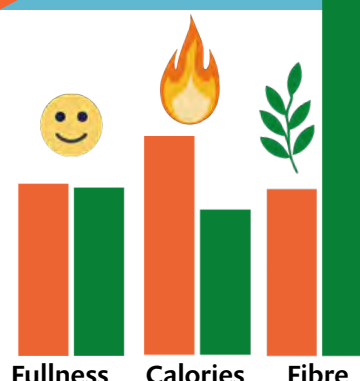
Dinner

Lower energy dense:



Grilled chicken with oven-baked chips, peas and gravy

435g
473 calories
8.5g fibre



Plant-based chilli with baked sweet potatoes

425g
281 calories
20.8g fibre

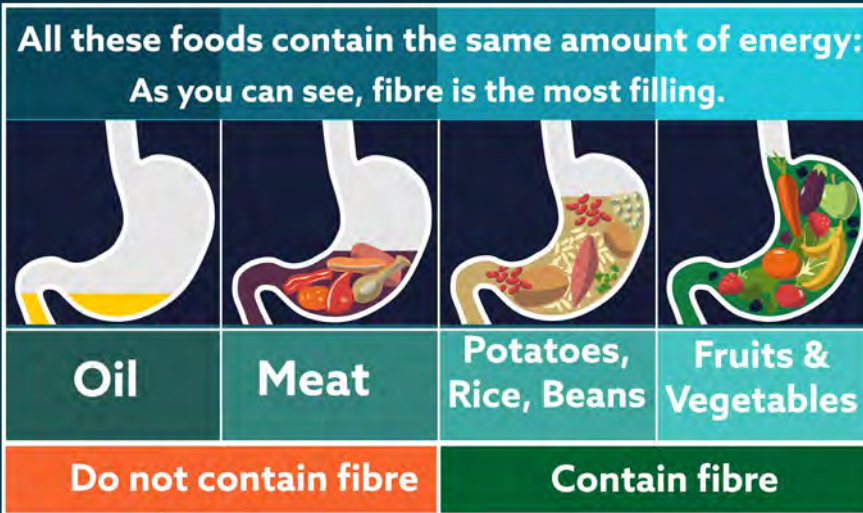
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What 500 calories looks like

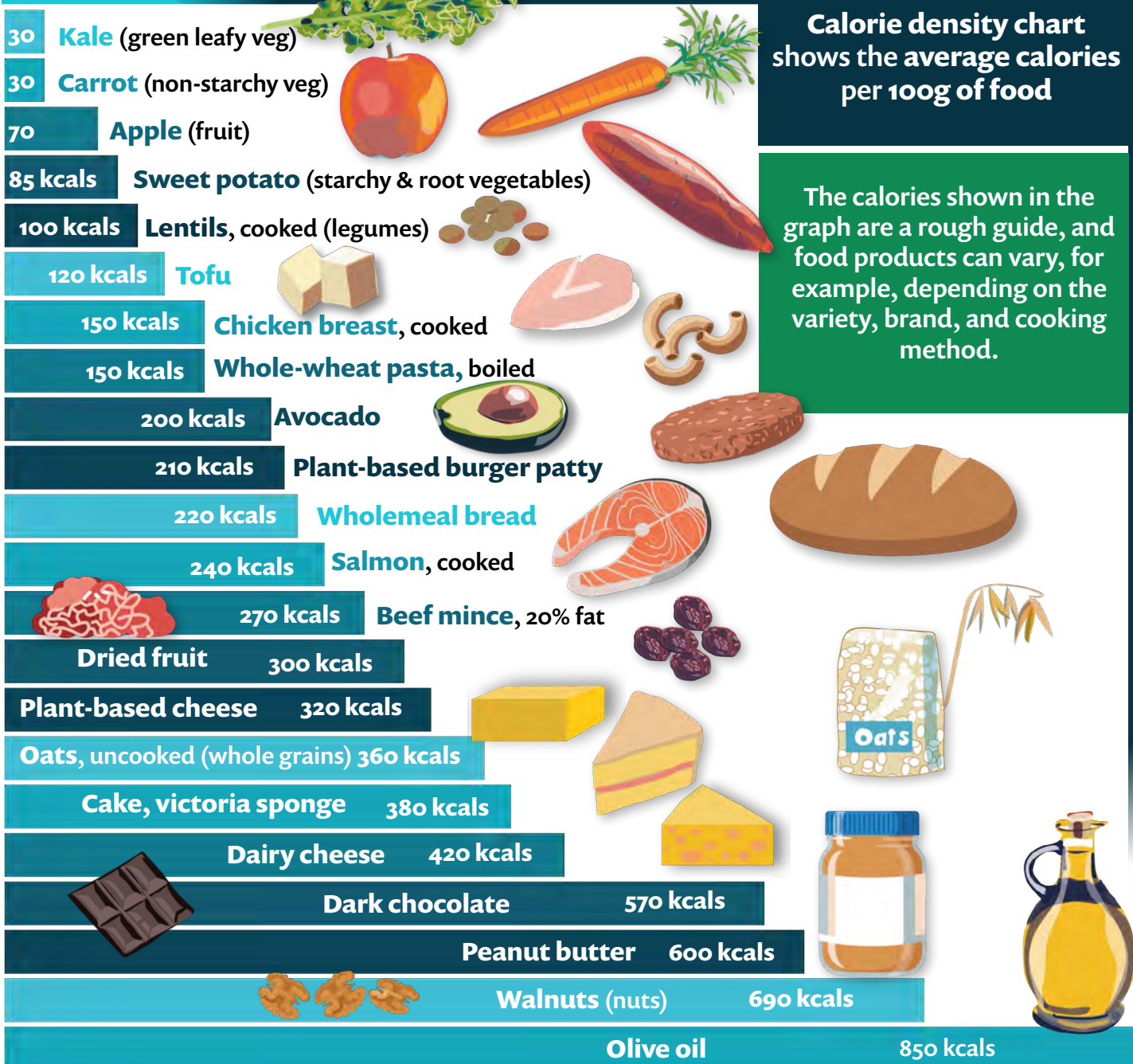


References:

Energy Density factsheet by The British Dietetic Association

Food data taken from the **Food & Nutrition-NBRI database** by the Quadram Institute, and the Carbs and Cals recipe app. Where foods were not available, an average value was taken of products available in UK supermarkets.

kcal per 100g



Calorie density chart shows the average calories per 100g of food

The calories shown in the graph are a rough guide, and food products can vary, for example, depending on the variety, brand, and cooking method.