

Rationale for the Power Up icons for children in the VEGPOWER Book

There are many reasons why vegetables are beneficial in our diets, and the Power Up game focuses on the micronutrient and fibre content. We have used the latest science to select 7 areas of health that are vital to children's growth and development, and all of them are supported by veg.

We have reviewed the micronutrient content from veg, both veg on their own and as part of meals by taking account of the effects of cooking, using food information from the UK Institute of Food Research and the United States Department of Agriculture.

We then compare the levels of nutrients against the latest European guidelines on how much of a nutrient the veg needs to contain to be super-healthy for the immune system, growth, bones, heart, brain, eyesight & energy metabolism.

We then allocated 'Power Up' icons to each veg and recipe depending on the micronutrients and fibre they contain. All of this makes our Power up Icons a very real symbol of the amazing goodness your family get from veg!

The resulting 7 power up icons are:

1. Immune System - Bug Buster
2. Growth (cells and DNA) - Regeneration
3. Bones (and teeth) – Steel Bones
4. Heart (“the engine that drives your body”) - Love Heart
5. Brain – Buzzing brains
6. Eyesight - Night Vision
7. Energy (sugar free energy) – Ultimate Power Up

Summary of the approach and Rationales to the VegPower Icon Game

The 7 Icons & contributing nutrients

Bug Buster (Immune system)

Copper, selenium, zinc, iron, vitamin E, vitamin A, vitamin B6, vitamin D & vitamin C

Regeneration (Cells & DNA)

Magnesium, phosphorus, zinc, manganese, folate, biotin & thiamin

Steel Bones

Calcium, magnesium, manganese, phosphorus, vitamin K & vitamin D

Love Hearts

Potassium, folate & Fibre

Buzzing Brains

Folate, zinc & iron

Night Vision

Vitamin A, riboflavin, lutein & zeaxanthin

Ultimate Power UP (Energy metabolism)

Magnesium, phosphorus, copper, manganese, iron, niacin, pantothenic acid, thiamin, riboflavin, vitamin B6, folate & vitamin C

The Qualification process

The EU has laid down regulations (EC [1924-2006](#) and [1169/2011](#)) for food producers to enable them to make 'Excellent source of' claims and the respective health claims that can be made for specific micro nutrients.

These are: If 100g or a single portion of a product contains 30% or more of the Nutrient Reference Value (NRV) for a specific vitamin, mineral or fibre, 'excellent source of' claims can be made along with specific health benefit claims. NRVs are set for the entire population (regardless of age) for each vitamin & mineral, for example 80mg per day of vitamin C.

Process for Individual Vegetables

We analysed each vegetable using the checkyourfood.com algorithm. The CheckYourFood (CYF) algorithm integrates food composition data (McCance & Widdowson & the USDA), the effects of cooking on nutrients, and the percent of NRVs that ingredients and recipes meet after cooking. Each vegetable was assessed for its full nutrient content per 100g, and the percent of the EU NRV it contained for nutrients that contribute to the power up icons (after applying a likely cooking method). In line with the EU threshold, if 100g of a vegetable had 30% or more of the NRV for the nutrients contributing to the power up icons we awarded it the respective veg power icon.

Process for Recipes

We also analysed the veg content per serving of each recipe using the CYF recipe analyser and assessed them for the percent of the EU NRV that they contained. This calculation was made only on the veg in the recipe for one serving, and not the other ingredients. For the purposes of this exercise, we used the 5-a-day definition of vegetables, which allows for one portion of pulses to be counted as a vegetable. In line with the EU threshold, if a serving of recipe had 30% or more of the NRV for the nutrients contributing to the power up icons we awarded it the respective veg power icon.

For example, in analyzing the recipe for Grinch green eggs and ham (p40), we tallied up the content of spinach, parsley and basil in the recipe, divided the total amount of nutrients by the number of servings in the recipe, and then assessed if each serving of the recipe contained more than 30% of the NRV for the respective power up nutrients. This recipe contained more than 30% of the NRV for Vitamin K per serving and was thus awarded a Steel Bones power up icon.

Icon Claims

We complied with the EU Register on Nutrition and Health claims for specific nutrients and used these to assess the appropriateness of the nutrient claims that underpin the Power Up icons.

Recipes or vegetables that failed to meet the 30% threshold for any contributing nutrients were assessed to see if they met the EU regulation on fibre claims of either 3g per 100g (for individual veg) or 1.5g per 100 calories (for recipes). On this basis they were assigned a Love Hearts power up, in line with the US Institute of Medicine's recommended [Adequate Intake of fibre](#), which was determined on the basis of a high fibre diet being associated with reduced risk of cardiovascular disease.

There is strong evidence that the phytochemicals Lutein and Zeaxanthin contribute to eye health, and a recent scientific review found that there is likely sufficient evidence for these phytonutrients to be incorporated into daily dietary recommendations.¹ However this has not been done yet and these nutrients are therefore not included in the EU register. Check Your Food has assessed the average amount of lutein and zeaxanthin across 131 foods using USDA nutrient composition data, which is 1,900 micrograms per 100g. We considered veg to be a good source of lutein and zeaxanthin if they contain above this average amount. For recipes we considered them to be a good source of lutein and zeaxanthin if they contained more than this amount per serving. It is important to note that vegetables which qualify for lutein and zeaxanthin nearly always contain beta carotene (pre-cursor to Vitamin A) and riboflavin, the other two qualifying nutrients for eyesight.

¹ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5715043/#CR4>;
<https://medlineplus.gov/druginfo/natural/754.html>;