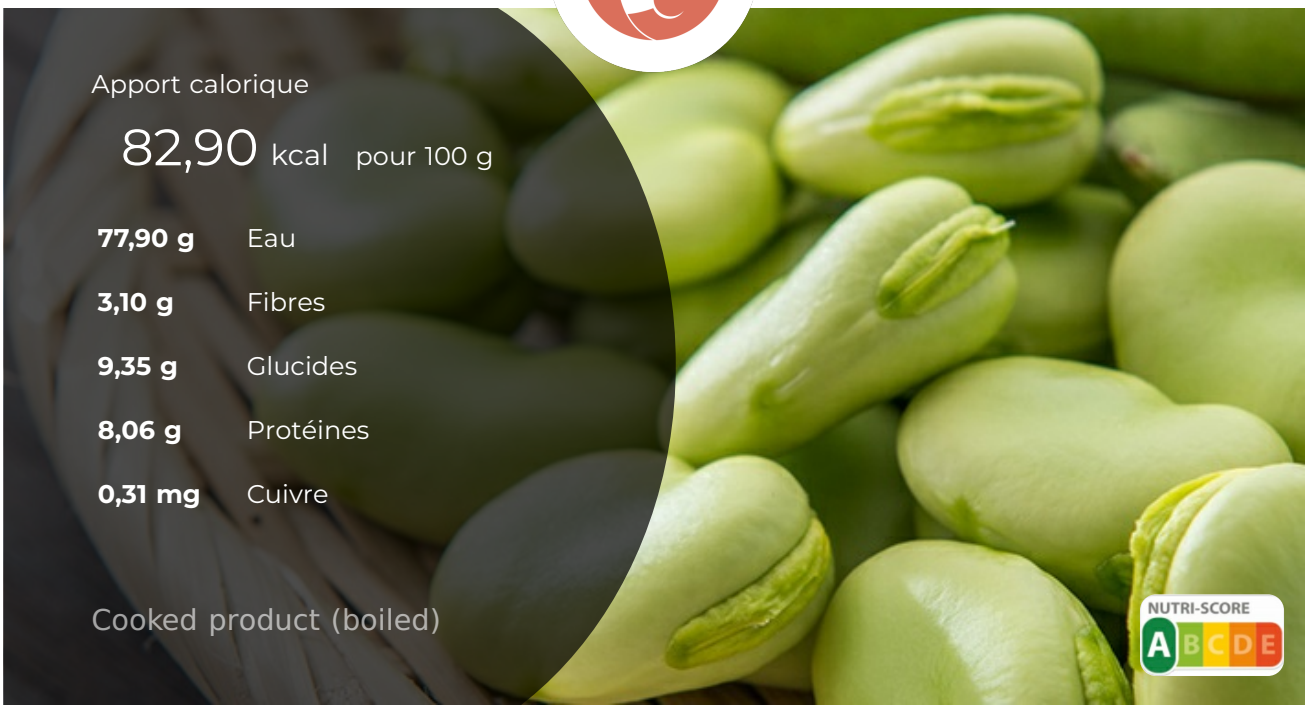
FICHE NUTRITIONNELLE

BROAD BEANS



DESCRIPTION

- Broad beans (Vicia faba) belong to the **Fabaceae** family.
- There are **different cultivars** of broad bean, including Windsor White, Bachus and Basta (Pysz, 2012).

PHYSICAL AND ORGANOLEPTIC CHARACTERISTICS

- The volatile profile of a Canadian broad bean variety (Vivia faba var. Minor) was studied. Despite their **low lipid content**, significant amounts of **volatile substances** normally associated with unsaturated fatty acids were present (Akkad, 2019).
- It has been shown that the **volatile compounds** of broad beans are aromatic hydrocarbons, aldehydes, alkanes, alkenes, alcohols, ketones, furans and other compounds (Roland, 2017).
- The unpleasant flavours reported for broad bean protein isolates **may depend on pH.** At neutral pH, a dried pea flavour was reported, while at acidic pH, an unpleasant fruity flavour was reported (Roland, 2017).
- Ordinary broad beans contain up to 8-9% tannins, a subgroup of **polyphenols** which may explain their perceived **bitterness** (Roland, 2017). The presence of saponin is also thought to be responsible for the **bitter taste** of broad beans (Marais, 2016).

COMPOSITION CHARACTERISTICS (EXCLUDING MACRONUTRIENTS, VITAMINS AND MINERALS)

- 155 primary and secondary metabolites were found to be present in the broad bean seed, mainly **polyphenols, organic acids, alkaloids, terpenoids** and **jasmonates** (Abu-Reidah, 2014). Specifically, 134 phenolic and other phytochemical compounds were found in the extract of Vicia faba, most of which have not been described so far in broad beans (Abu-Reidah, 2017).
- Among the **phenolic compounds** are functional flavonoids such as tannin, proanthocyanidins (especially prodelphinidin and catechin), L-3,4-dihydrophenylalanine (L-dopa), flavonols and flavones (especially myricetin, quercetin, apigenin, kaempferol and aglycones or glycosides without luteolin) whose content is correlated with **antioxidant activity** (Boukhanouf, 2016; Kwon, 2018).
- Phenolic compounds have the benefit of **reducing the risk of hypertension, cancer** and mutagenic activity and L-dopa compounds have anticancer properties and are reportedly beneficial in combating **Parkinson's disease** (Kwon, 2018; Shetty, 2019).

COMPOSITION ET ANALYSE NUTRITIONNELLE

BOILED

The following values are approximate and depend on variety, season, ripeness, cultivation conditions, etc.
The average boiled broad bean provides **82.90 calories (kcal)** per 100 g, i.e. **350 kJ**.
COMPOSITION TABLES
For each nutrient, the tables provide information on the content, minimum and maximum values, as well as the percentage of the Dietary Reference Values (DRVs) per 100 g net of boiled broad beans (except for the table on polyphenols, which is based on steamed broad beans).

MACRONUTRIMENTS

Valeurs

Constituant (g)	Teneur moyenne	Min-Max pour 100 g	% VNR
Eau	77,9	71,50 - 83,70	-
Fibres	**3,10**	**NC - 5,40**	**-**
Glucides	9,35	-	-
dont Sucres	0,40	NC - 1,82	-
Lipides	0,80	0,40 - NC	-
dont Acides Gras Saturés	0,16	0,066 - NC	-
Protéines	8,06	4,80 - NC	-

Sources

Constituant (g)	Quantité	Min-Max	% VNR
Eau	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	-
Fibres	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	-
Glucides	Ciqual 2020	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011
dont Sucres	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011
Lipides	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011
dont Acides Gras Saturés	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011
Protéines	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011

Zoom on carbohydrates

- The energy of boiled broad beans comes mainly from its carbohydrates, up to 9.35 g per 100 g.
- This is lower than the average amount found in cooked legumes (12.96 g per 100 g).
- Their carbohydrates are mainly in the form of starch (7.60 g per 100 g) and sucrose (0.40 g per 100 g).
- Boiled broad beans can be said to be « **sugar-free*** " because they contain less than 0.5 g of sugar per 100 g, i.e. 0.4 g.

Zoom on fibres

- Boiled broad beans are **a source of fibre*** as they provide more than 3 g per 100 g, i.e. 3.10 g per 100 g.
- This amount of fibre is lower than the average quantity found in cooked legumes (8.36 g per 100 g).

Zoom on proteins

- Boiled broad beans are **high in proteins*** as they provide more than 38.60% of their energy value, i.e. 8.06 g of proteins per 100 g. A foodstuff is rich in protein if at least 20% of its energy value is produced by proteins.
- This protein content is higher than the average amount found in cooked legumes (7.84 g per 100 g).
- Microwave cooking reduces the activity of trypsin inhibitors and the solubility of proteins. On the other hand, it increases their digestibility (Pysz, 2012).

Zoom on lipids

- The amount of fats (0.80 g per 100 g) in boiled broad beans is lower than the average quantity present in cooked legumes (0.95 g per 100 g).
- Boiled broad beans **are low in fat*** as they contain no more than 3 g per 100 g.

*Regulation (EC) No 1924/2006 of the European Parliament and of the Council of 20 December 2006 on nutrition and health claims made on foods.

MINÉRAUX ET OLIGO-ÉLÉMENTS

Valeurs

Constituant	Teneur moyenne	Min-Max pour 100 g	% VNR
Calcium (mg)	37	18 - NC	4,63
Chlorure (mg)	< 20	-	-
Cuivre (mg)	**0,31**	**0,06 - NC**	**31**
Fer (mg)	1,50	-	10,71
Iode (µg)	< 20	-	-
Magnésium (mg)	37	31 - 43	9,87
Manganèse (mg)	**0,31**	**0,26 - 0,42**	**15,50**
Phosphore (mg)	**160**	**73 - NC**	**22,86**
Potassium (mg)	200	193 - 268	10
Sélénium (µg)	< 20	-	-

Constituant	Teneur moyenne	Min-Max pour 100 g	% VNR
Sodium (mg)	10	5 - 41	-
Zinc (mg)	1	0,47 - 1,01	10

Sources

Constituant	Quantité	Min-Max	% VNR
Calcium (mg)	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011
Chlorure (mg)	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011
Cuivre (mg)	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011
Fer (mg)	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011
Iode (µg)	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011
Magnésium (mg)	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011
Manganèse (mg)	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011
Phosphore (mg)	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011
Potassium (mg)	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011

Constituant	Quantité	Min-Max	% VNR
Sélénium (µg)	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011
Sodium (mg)	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	-
Zinc (mg)	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011

Zoom on minerals and trace elements

- Boiled broad beans are **high in copper** as they provide the equivalent of 31% of DRVs, i.e. 0.31 mg per 100 g. According to the Ciqual 2020 table, cooked broad beans are the most copper-rich cooked legume.
- They are also a **source of:**
  - **phosphorus** as they provide the equivalent of 22.86% of DRVs, i.e. 160 mg per 100 g. According to data from the Ciqual 2020 table, cooked broad beans are among the legumes with the highest phosphorus content.
  - **manganese** as they provide the equivalent of 15.50% of DRVs, i.e. 0.31 mg per 100 g.
- Boiled broad beans also contain significant amounts of **iron, potassium** and **zinc.** They provide the equivalent of:
  - 10.71% of DRVs for iron, i.e. 1.50 mg per 100 g;
  - 10% of DRVs for potassium, i.e. 200 mg per 100 g;
  - 10% of DRVs for zinc, i.e. 1 mg per 100 g.

VITAMINES

Valeurs

Constituant	Teneur moyenne	Min-Max pour 100 g	% VNR
Provitamine A Béta-carotène (µg)	206	9 - NC	-
Équivalent Vitamine A (µg)	34,33	1,50 - NC	4,29
Vitamine B1 (mg)	0,043	NC - 0,13	3,91
Vitamine B2 (mg)	0,064	NC - 0,09	4,57
Vitamine B3 (mg)	0,69	NC - 1,20	4,31
Vitamine B5 (mg)	0,12	0,066 - 0,16	2
Vitamine B6 (mg)	0,037	0,029 - 0,072	2,64
Vitamine B9 (µg)	**65,30**	**58 - 104**	**32,65**

Constituant	Teneur moyenne	Min-Max pour 100 g	% VNR
Vitamine C (mg)	< 0,50	0,30 - 19,80	-
Vitamine E (mg)	0,28	0,02 - 0,40	2,33
Vitamine K1 (µg)	5,52	2,90 - NC	7,36

Sources

Constituant	Quantité	Min-Max	% VNR
Provitamine A Béta-carotène (µg)	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	-
Équivalent Vitamine A (µg)	Calcul à partir de la valeur Provitamine A Béta-carotène*	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011
Vitamine B1 (mg)	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011
Vitamine B2 (mg)	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011
Vitamine B3 (mg)	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011
Vitamine B5 (mg)	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011
Vitamine B6 (mg)	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011
Vitamine B9 (µg)	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011
Vitamine C (mg)	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011

Constituant	Quantité	Min-Max	% VNR
Vitamine E (mg)	Ciqual 2020	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011
Vitamine K1 (µg)	Ciqual 2020 (valeur issue des analyses Ciqual-Aprifel 2018)	-	Règlement (UE) N°1169/2011 du parlement Européen et du conseil du 25 octobre 2011

Zoom on vitamins

- Boiled broad beans are **high in vitamin B9** as they provide the equivalent of 32.65% of DRVs, i.e. 65.30 µg per 100 g.
- The other vitamins are present in quantities of less than 8%.

* Calculation made: Beta-Carotene / 6 + retinol

POLYPHÉNOLS

Valeurs

Constituant (g)	Teneur moyenne	Min-Max pour 100 g
Polyphénols totaux	**0,74**	**0,74 - 0,74**

Sources

Constituant (g)	Quantité	Min-Max
Polyphénols totaux	**Phenol explorer, version 3.6 Méthode utilisée : Folin Assay**	**-**

Zoom on polyphenols (for steamed broad beans)

- Polyphenols are substances with an antioxidant effect.
- Steamed broad beans contain 0.74 mg of total polyphenols per 100 g according to the folin assay.

ALLÉGATIONS NUTRITIONNELLES ET DE SANTÉ

ALLÉGATIONS NUTRITIONNELLES ET DE SANTÉ BOILED

According to the definitions of nutrition claims as set out in Regulation (EC) No 1924/2006 on nutrition and health claims, and in view of the composition of broad beans, the following claims may be used:

NUTRITION CLAIMS OF COOKED BROAD BEANS

- **Sugar-free** (100 g of broad beans contain no more than 0.5 g of sugars)
- **Low in fat** (100 g of broad beans contain no more than 3 g of fat)
- **High in protein** (more than 20% of the energy value of cooked broad beans is produced by protein)
- **High in vitamin B9** (100 g of cooked broad beans provide the equivalent of more than 30% of DRVs)
- **High in copper** (100 g of cooked broad beans provide the equivalent of more than 30% of DRVs)
- **Source of fibre** (100 g of cooked broad beans provide more than 3 g of fibre)
- **Source of phosphorus** (100 g of cooked broad beans provide the equivalent of more than 15% of DRVs)
- **Source of manganese** (100 g of cooked broad beans provide the equivalent of more than 15% of DRVs)

HEALTH CLAIMS (FOR A CONSUMPTION OF 100 G OF COOKED BROAD BEANS)

Folates or vitamin B9

- Folates contribute to:
  - maternal tissue growth during pregnancy,
  - normal amino acid synthesis,
  - normal blood formation,
  - normal homocysteine metabolism,
  - normal psychological function,
  - normal function of the immune system,
  - reduction of tiredness and fatigue.
- Folates have a role in the process of cell division.

Copper

- Copper contributes to:
  - maintenance of normal connective tissues,
  - normal energy-yielding metabolism,
  - normal functioning of the nervous system,
  - normal hair pigmentation,
  - normal iron transport in the body,
  - normal skin pigmentation,
  - normal function of the immune system,
  - protection of cells from oxidative stress.

Phosphorus

- Phosphorus contributes to:
  - normal energy-yielding metabolism,
  - normal function of cell membranes,

- maintenance of normal bones,
- maintenance of normal teeth.

- Phosphorus is necessary for normal growth and bone development in children. (Art 14)

Manganese

- Manganese contributes to:
  - normal energy-yielding metabolism,
  - maintenance of normal bones,
  - normal formation of connective tissues,
  - protection of cells from oxidative stress.

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