

F&V: CALORIES, NUTRIENTS AND CLAIMS

- ▶ The **energy density** of a food is its caloric intake, as a function of its weight and volume (in kcal/100 g of a food).
- ▶ Nutrient density aims to determine **nutrient quality of food**. It represents the content of micronutrients (vitamins, minerals) relative to the energy intake (in g, mg or µg of a micronutrient / 100 kcal, 100 g, or a serving size).
- ▶ The methods used to quantitatively assess nutrient quality of foods have collectively become known as “**nutrient profiling**”¹.
- ▶ In France as well as in other European countries (Belgium, Switzerland, Germany, Spain, the Netherlands and Luxembourg), the **Nutri-score logo** was chosen. Designed by Santé Publique France to inform about nutrition quality of food, it is based on a 5-color scale associated with A to E letters. It takes into account nutrients and foods to encourage (fibers, proteins, fruits, vegetables) and to limit (energy, saturated fatty acids, sugar and salt)².
- ▶ Patients often refer to the energy density of food and tend to focus on calories, while the most relevant indicator is **nutrient density**.
- ▶ Nutrition and health claims shed light on information related to the presence of specific nutrients.



General definitions

1. Nutrition claims

- Nutrition claims state, suggest or imply that a food **has particular beneficial nutritional properties**. They refer to nutrient content in a food.

- A food can have the nutrition claim:

- “**Low energy value**” if it provides less than 40 kcal/100 g,
- “**Source of vitamin/mineral/trace element**” if their content in 100 g is at least 15 % above the DRVs,
- “**Rich in vitamin/mineral/trace element**” if their content in 100 g is at least 30 % above the Dietary Reference Values (DRVs),
- “**Source of fiber**” if their content is at least 3 g of fiber/100 g or at least 1.5 g of fiber per 100 kcal,
- “**Rich in fiber**” if their content is at least 6 g of fiber/100 g or at least 3 g of fiber per 100 kcal³.

2. Health claims

Health claims are statements about a relationship between food and health. To be authorized by the Commission, they should be based on scientific evidence and easily understood by consumers³. Only those authorized by the Commission (positive list) can be used if the food is «source of» or «rich in»³.

The case of fruit and vegetables

- Fruit and vegetables are a typical example of foods with a **high nutrient density**: the content of vitamins and minerals is usually high while the energy intake is usually low¹.

- Table 1 shows **energy and nutrient content** of the 20 most consumed F&V in mainland France (excluding Corsica) in 2015-2017^{a 7-10}.

- **Fiber, folic acid, vitamin A, vitamin C and potassium** are the main nutrients of interest present in F&V¹¹. These nutrients have many health claims detailed in table 2.

BOX 1: DIETARY REFERENCE VALUES (DRVS)

1. DRVs serve to establish nutrition claims, except for energy content and fiber.

2. DRVs gather a set of nutrient reference values including, among others, the population reference intake (PRI), the average requirement (AR), the adequate intake (AI) and the reference intake range (RI).

3. DRVs are not nutrient goals or recommendations for individuals. They are intended for healthy people and not for those who suffer from diseases or for groups with specific needs.

4. They are used by **nutrition and health professionals** in dietary assessment and diet planning at population and individual level. They can also serve as the basis for risk managers or policy makers to set reference values in food labelling and establish food-based dietary guidelines^{4,5}.

5. The DRV Finder is an **interactive tool** that gives quick and easy access to EFSA's DRVs for nutrients⁶.



- In addition, the fruit and vegetables analyzed in the study carried out by Aprifel and ANSES^a **are all classified in the Nutriscore «A» category**^{2, 8-10}.

- Tables 1 and 2 will let you help your patients **better understand** why these claims may appear on their food.

^aThe average composition is given as an indication: the values are to be considered as orders of magnitude, likely to vary according to the varieties, the season, the degree of maturity, the growing conditions, etc. As part of a partnership with the French National Agency for Food, Environmental and Occupational Health Safety (ANSES), Aprifel carried out over two years (2017-2018) a nutritional analysis program of scope including more than 100 F&V consumed in Metropolitan France. These data are present in the French nutritional composition table, Ciqual, managed by ANSES^a, the Ciqual table extended for the calculation of nutrient density Calnut 2020^a and in the Aprifel nutritional sheets¹⁰.

► Tableau 1 : Energy and nutrient content of the 20 most consumed F&V in mainland France (excluding Corsica)⁷⁻¹⁰

MOST CONSUMED F&V	ENERGY KCAL/100G	FIBER g/100g	FOLIC ACID µg/100g	VITAMIN A EQUIVALENT µg/100g	VITAMIN C mg/100g	POTASSIUM mg/100g
1 - Cucumber ^b	14,70	0,80	7,20	4,05	3,52	140
2 - Salad ^c	16,08	1,80	70,45	442,29	8,09	231,75
3 - Zucchini (whole, baked/roasted)	23	1,70	16,40	69,16	<0,50	300
4 - Tomato ^d	23,48	1,15	27,88	164,92	17	237,50
5 - Endive (baked/roasted)	23,50	<0,50	5,89	2,75	<0,50	180
6 - Leek (boiled)	27,40	3,40	22,80	57,17	3,79	120
7 - Cauliflower (steam cooked)	30,10	1,80	54,30	0,94	21,40	300
8 - Head cabbage ^e	31,83	3,13	56,47	53,50	32,19	243,67
9 - Carrot (raw)	40,20	2,70	59,40	1381,67	2,05	230
10 - Onion ^f	41,30	2,45	20,03	<0,83	4	245
11 - Orange	45,50	2,70	25,90	<0,83	47,50	180
12 - Peach ^g	46,48	1,30	10,61	21,67	3,70	182,50
13 - Clementine/Mandarin	47,30	1,70	27,60	24,50	49,20	140
14 - Pear ^h	53,60	3,10	15,50	3,22	1,98	109,50
15 - Apple ⁱ	55,02	2,27	7,46	5,62	1,97	110,20
16 - Kiwi	60,50	2,40	22,20	6,33	81,90	290
17 - Melon	62,70	1,30	58,90	416,67	8,14	380
18 - Grapes ^j	84,60	2,35	9,67	7,93	3,63	180
19 - Banana	90,50	2,70	19	4,75	7,16	320
20 - Avocado	205	3,60	70,40	<0,83	<0,50	430

^b Values of raw cucumber, peeled.

^c Mean values of raw lettuce, Romaine lettuce, Batavia and oak leaf.

^d Mean values of raw cherry tomato, round tomato, cluster tomato and ribbed or beef heart tomato.

^e Mean values of raw red cabbage, green cabbage and white cabbage.

^f Mean values of cooked red onion and yellow or white onion (sautéed / pan-fried without fat).

^g Mean values of white peach (whole and peeled) and yellow peach (peeled).

^h Mean values of two varieties of pear: Conference (peeled) and Williams (peeled)

ⁱ Mean values of different varieties of apple: Granny Smith (whole and peeled), Golden (whole and peeled), Chantecler (peeled), Gala (peeled) and Pink Lady (peeled).


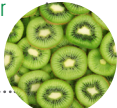


^j Mean values of white grapes (Chasselas) and black grapes (Muscat).

- Low energy value
- Rich in
- Source of

Example of nutrition claim

Salad has a **low energy content** and is **rich in vitamin A** and **in folic acid**.

► Table 2: Health claims of folic acid, vitamin A, vitamin C and potassium

FOLIC ACID RELATED HEALTH CLAIMS ¹²⁻¹⁴	VITAMIN C RELATED HEALTH CLAIMS ¹²⁻¹⁴	VITAMIN A RELATED HEALTH CLAIMS ¹²⁻¹⁴	POTASSIUM RELATED HEALTH CLAIMS ¹²⁻¹⁴
<p>Folic acid contributes to:</p> <ul style="list-style-type: none"> - maternal tissue growth during pregnancy, - normal amino acid synthesis, - normal blood formation, - normal homocysteine metabolism, - normal psychological functions, - normal function of the immune system, - reduction of tiredness and fatigue. <p>Folic acid has also a role in normal cell division.</p>  <p>Most consumed F&V* that are rich in/source of folic acid:</p> <ol style="list-style-type: none"> 1. Salad 2. Avocado 3. Carrot 4. Melon 5. Head cabbage 6. Cauliflower 	<p>Vitamin C contributes to:</p> <ul style="list-style-type: none"> - reduction of tiredness and fatigue, - normal psychological function, - the regeneration of the reduced form of vitamin E, - normal energy-yielding metabolism, - the normal function of the immune system, - maintain the normal function of the immune system during and after intense physical exercise, - protection of cells from oxidative stress, - normal collagen formation for the normal function of bones, teeth, cartilage, gums, skin and blood vessels, - normal functioning of the nervous system. <p>Vitamin C increases iron absorption.</p> <p>Most consumed F&V* that are rich in/source of vitamin C:</p> <ol style="list-style-type: none"> 1. Kiwi 2. Clementine/Mandarin 3. Orange 4. Head cabbage 5. Cauliflower 6. Tomato 	<p>Vitamin A contributes to :</p> <ul style="list-style-type: none"> - normal function of the immune system, - maintenance of normal skin and mucous membranes, - maintenance of normal vision, - normal iron metabolism. <p>Vitamin A has a role in the process of cell specialisation.</p>  <p>Most consumed F&V* that are rich in/source of vitamin A:</p> <ol style="list-style-type: none"> 1. Carrot 2. Salad 3. Melon 4. Tomato 	<p>Potassium contributes to:</p> <ul style="list-style-type: none"> - normal muscular function, - normal functioning of the nervous system, - the maintenance of normal blood pressure.  <p>Most consumed F&V* that are source of potassium:</p> <ol style="list-style-type: none"> 1. Avocado 2. Melon 3. Banana 4. Cauliflower 5. Zucchini

* in mainland France (excluding Corsica)⁷

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