

On Apples, Tomatoes, Carrots, and Other Fruits: Controversies Concerning Categorisation

Abstract

While at first glance the difference between fruit and vegetables appears to be clear, there are some problematic cases. One of them is the tomato, which is commonly regarded as a vegetable, although – technically speaking – it is a fruit. The aim of the present paper is to explain the controversies concerning the classification of tomatoes and other similar examples. In particular, the prototype-based approach to categorisation appears to offer a better chance of revealing the mechanisms that stand behind the issue of categorisation, than the classical approach.

Keywords: categorisation, fruit, plant, prototype, vegetable.

1. Introduction

Critics of the European Union have at their disposal a number of examples which expose the inconsistency and illogicality of certain EU regulations. One of them is the statement that the carrot is a fruit, which can be found in a directive relating to fruit jams and other jam-like food products (*Council Directive 2001/113/EC*).¹ A careful reader of the document will notice that it is “for the purposes of this Directive” that the above-mentioned foodstuffs are included into the category FRUIT. This, in turn, suggests that – rather than being undereducated – the authors of the directive tried to avoid further complication of EU legislation while accounting for certain unique regional recipes. In other words, they wanted to – so to speak – have their jam and eat it.

¹ The document is a revised version of the *Council Directive 79/693/EEC*.

It is not the aim of the present paper to argue for or against legislative proposals of EU bureaucrats, let alone the EU itself. Yet I will argue that ordinary EU citizens (or language users) display a similar craving for order, which sometimes leads them to equally paradoxical conclusions.

2. Fruit: a definition

First, however, let us try to come up with a clear definition of the category that has caused the confusion, namely FRUIT. Traditionally, it contrasts with the category VEGETABLE, both denoting food derived from plants. As to the differences, on the face of it, enumerating properties common to all members of a category which is so familiar to human beings appears to be child's play. Yet a moment of reflection suffices to reveal the difficulties inherent in the task. Firstly, there is no clearly distinguishable shape that all fruits share: arguably, the majority of them are round or roundish (oranges, peaches, berries, grapes, apples, *etc.*), or oval (lemons, kiwis, *etc.*). However, there are popular fruits with distinct non-round shape, such as strawberries, bananas, or pineapples. Colour is of even less assistance, for while red, yellow and green seem the most common, in fact fruits occupy almost the whole spectrum of light perceptible by humans.² Taste appears to be more promising, as most fruits are praised for their sweetness. Even so, some fruits – such as grapefruit, lemon, lime and pomegranate – are bitter or sour. Finally, the sense of touch can offer some clues, albeit not conclusive. In particular, many fruits are succulent, yet many others are pulpy. To add to the confusion, virtually all of the above-mentioned potential defining characteristics may vary within the species.³

Having been failed by common knowledge, we may turn to more technical aspects of the category in question. From the botanical point of view, a fruit is a mature ovary containing one or more seeds from which another specimen of a particular plant may evolve (*EB*). At first glance there is nothing controversial about this definition, and most people would probably see it as a welcome solution to the problem. Yet the logical consequence of such an assumption may be more difficult to accept. In particular, taking the seed as a basis for the definition means including tomatoes, cucumbers, beans, corn and all kinds of nuts into the category FRUIT. Yes, technically speaking, these are all fruits, although most people would probably not classify them as such.⁴

As can be seen, there is an evident mismatch between the scientific and popular understanding of the category FRUIT, the latter being less accurate and objective. The question arises, then, whether we should discuss the naïve view of the concept of FRUIT at all, given its shortcomings. The answer is (obviously) “yes,” not only for the sake of satisfying the academic thirst for knowledge about the meanders of human reasoning, but also, or – we should say – first of all, because it is the nonscientific interpretation that most people usually employ. In other words, it may not be true, yet it is real. Thus, a researcher's task

2 The only colour absent from fruits is blue, although some could be described as “bluish.”

3 Consider, for instance, the range of different hues, shapes, sizes and tastes which can be found in apples.

4 We may mention in passing another problem with the botanical definition: many fruits sold commercially – for instance nearly all bananas – are in fact seedless clones of a single cultivar, that is, a plant variety obtained through selective breeding (*EFN*). Obviously, we might at this point object to this argument on the grounds that seedless fruits are mutant forms of their “seed-full” counterparts. Still, it does not change the fact that a banana bought at a local marketplace will almost certainly be lacking seeds, and yet nobody will question its status as a fruit.

is to explain the origin of the discrepancy as well as the appeal of the popular view. Let us begin, however, with a few comments concerning the internal structure of the category in question.

3. Fruit as a prototype category

The necessity of accounting for the internal structure of the non-expert version of the category FRUIT stems from the fact that – unlike its scientific counterpart – it eludes the traditional, or classical approach to categorisation by means of listing the so-called *essential features*, a concept which goes back to Aristotle (see Tredennick 1933: 239). Instead, it resembles Wittgenstein's ([1953] 1978: 31–33) example of GAME, a category held together by a network of family resemblances, whereby even the most characteristic properties are shared only by some members of a category. Thus, we can find various configurations of shape, size, colour, taste, *etc.* among fruits, yet there is no feature common to all. The presence of seeds is of little help either, since they can also be found in tomatoes, cucumbers, nuts, *etc.*, which are not perceived as members of the category in question. By the same token, the information that a fruit is part of a plant is too general to be useful.

Importantly, admitting the limitations of the classical approach and viewing the concept of FRUIT as a Wittgensteinian category does not necessarily mean accepting overwhelming chaos. To put it differently, treating none of the properties as universal does not mean regarding all of them as equally important. Indeed, some properties are more common and/or more salient than others. Consequently, we may distinguish the centre and the periphery of the category, or – to use the terminology introduced by American cognitive anthropologists and psychologists (see Berlin & Kay 1969; Heider 1971, 1972; Rosch 1975) – *prototypical* and *peripheral* members.

3.1. The apple: a prototypical fruit

The attributes mentioned above, such as sweetness, round shape or succulence, apply to the prototypical representatives of the category FRUIT, rather than to all. There are many fruits which fulfil these criteria, such as peaches, cherries, oranges, or mangoes. Yet within Western civilisation the apple seems the natural candidate.

The plant originated in Central Asia and was probably one of the earliest trees to be cultivated (Sauer 1993: 110). Apple trees were widely grown in ancient Greece and Rome and the fruit found its way into mythology, for instance as the object which led to the Trojan War. As a matter of fact, the cultural status of the apple was already well-established in the Roman Empire, for it survived the transition from paganism to Christianity, settling firmly in the position of “forbidden fruit.”⁵ The apple was present in the minds of Europeans (and later also Americans) in various settings between the Middle Ages and the 21st century. It can be found on the head of William Tell's son, in the anecdote explaining how Isaac Newton discovered gravitation, in the German folk tale (collected by the Brothers Grimm) *Snow White*, in the nickname for the New York City, and in the name and logo of a prominent technology company.

The importance of the apple for the Western culture is also visible in the number of idioms and proverbs alluding to the fruit in various languages. Some, like *apple of discord* and *Adam's apple*, are derived

5 The Bible does not in fact mention the fruit by its name, yet Christian tradition often gave it the form of an apple, which can be seen in the art of Albrecht Dürer, Hans Holbein the Younger and Peter Paul Rubens, to provide but a few examples.

from the classical and biblical traditions (the *OED*). Others, such as *rotten apple* or *the apple doesn't fall far from the tree*, are examples of folk wisdom, with the fruit in question serving as a vehicle for describing traits of character (*CALD*). Yet others, like *the apple of one's eye* (the *OED*), draw on the characteristics of the fruit itself, which in this case is its roundness.⁶

Finally, and more to the point as far as the structure of the category fruit is concerned, the apple was so deep rooted in European culture that in various European languages its name can be seen as synonymous with the one denoting fruit in general. Thus, in ancient Greece *μήλον* 'apple' was also used as a generic term for fruits, especially exotic ones (*OLED*). The Romans used the term *mālum*, borrowed from the Greeks, to refer to apples, but also any soft fruit with a kernel inside, for example peaches, quinces, lemons, etc. (*LD*). Latin *pōmum*, in turn, which denoted both fruit in general and apples in particular (*LD*), became the source of French *pomme* 'apple' (*DD*). As a matter of fact, the French copied the classical pattern, for when the potato and tomato were brought to Europe from newly-discovered America in the 16th century, they were named, respectively, *pomme de terre*⁷ and *pomme d'amour*⁸ or *pomme d'or*,⁹ the latter two having been finally replaced by *tomate* only in the 19th century (*TLFi*).¹⁰ Likewise, between the 16th and 19th centuries the forms *love-apple* and *apple of love* could also be found in English (the *OED*). Even earlier than that, we can find O.E. *eorþæppla* 'cucumbers',¹¹ M.E. *appel of paradis* 'banana,' and M.E. *pineapple*¹² (the *OED*, *OLED*).

3.2. The tomato: a vegetable-like fruit

The above examples lead us to the question why the tomato, apparently once seen as a kind of fruit, is now considered a vegetable. The dilemma is not new and is by no means of academic nature only. In the 1880s, it gained a practical dimension in the United States of America after the introduction of a tariff which included imported vegetables, yet omitted fruits (Smith 1994: 151). The case ended up in the U.S. Supreme Court, which resolved it in 1893 by stating that:

Botanically speaking, tomatoes are the fruit of a vine, just as are cucumbers, squashes, beans, and peas. But in the common language of the people, whether sellers or consumers of provisions, all these are vegetables which are grown in kitchen gardens, and which, whether eaten cooked or raw, are, like potatoes, carrots, parsnips, turnips, beets, cauliflower, cabbage, celery, and lettuce, usually served at dinner in, with, or after the soup, fish, or meats which constitute the principal part of the repast, and not, like fruits generally, as dessert. (*Nix v. Hedden* 1893)

6 The apple stands here for the (supposedly round) pupil. The fact that there is a substantial number of fruits which are more round than the apple only proves its strong position in our culture.

7 Literally 'apple of the earth.'

8 Literally 'apple of love.'

9 Literally 'apple of gold.' This variant may be either a reference to a variety of the fruit, or – as reported by *FDLNT* and *OLED* – a corruption of Italian *pomodoro* (literally 'apple of gold'), which, in turn, was a corruption of earlier Italian *pomo da moro* (literally 'Moorish apple'). The Italian term is the source of Polish *pomidor* 'tomato' (*SWO*).

10 The two phytonyms can still be heard in the south of France (*TLFi*).

11 Literally 'earth-apples'; this term is mentioned in one source only.

12 Interestingly, the term originally meant 'pine cone,' so it was used metaphorically to describe a part of a plant that was not a real fruit. However, once it was extended – also metaphorically – to include the species *Ananas comosus*, as well as its fruit, it came close to making a full circle.

Thus, the right answer to the question which category – FRUIT or VEGETABLE – the tomato belongs to is: “both.” This is possible if we assume that the former is in fact a double category, a botanical one (part of a plant) and a culinary one (food). The two overlap, yet are not identical. It is the latter which contrasts with VEGETABLE.

Still, this does not explain why within folk taxonomy the tomato is *not* a fruit. After all, apart from having seeds, it shares some properties with many other fruits: it is round and juicy – in fact more so than the apple. True, it is not as sweet as the latter, but then again, some varieties of the apple are actually sour, so sweetness is not the only criterion. It may be the intensity that makes the difference – the tomato has low sugar content and does not “oversweeten” the dish it is included in. Consequently, it is used in soups, sauces, sandwiches, *etc.*, or a side dish, similarly to vegetables and other vegetable-like fruits, such as cucumbers and peppers, as well as legumes (including peas and beans).¹³

As a matter of fact, not all problematic cases of fruits are confused with vegetables. Some are actually perceived as separate categories. These include various kinds of nuts, such as the chestnut, hazelnut,¹⁴ or acorn, as well as cereal grains, such as the wheat, barley, oats, rye, maize and rice. From the botanical point of view, all of them are classified as dry fruits, as are the edible parts of buckwheat and sunflowers (Mauseth 2009: 535).

3.3. The carrot: a fruit-like vegetable

It needs to be stated that the above-mentioned criterion of cuisine does not save the classical approach to categorisation. On the contrary, the conventional element appears to invite a breach.¹⁵ Thus, the FRUIT/VEGETABLE distinction does not correlate strictly with that of DESSERT/MAIN COURSE, as can be seen in the traditional roast turkey with cranberry sauce, a staple of American Thanksgiving dinner and British Christmas dinner, or carrot jam, a Portuguese delicacy.¹⁶ The latter example is precisely what stood behind including carrots in the list of fruits in the above-mentioned EU directive (Bernard 2013: 98). For the carrot, similarly to prototypical fruits, is sweet; sweet enough to use it as the main ingredient of a jam or a cake. Other vegetables which have fruit-like properties are rhubarb¹⁷ and sweet potatoes, both mentioned in the directive under discussion.¹⁸

Admittedly, part of the confusion concerning the classification of fruits stems from the lack of symmetry between the categories FRUIT and VEGETABLE. In particular, while the former – even as a type

13 The term *legume* comes from French *légume*, whose primary sense – strangely enough – is ‘vegetable,’ although it can also refer to legumes (the *OED*, *TLFi*).

14 It should not perhaps by now come as a surprise that not all *-nuts* are in fact nuts. Specifically, the walnut, coconut (and also almond) belong to drupes, together with cherries and peaches, while the peanut is a legume (*EB*).

15 Cf. the saying *rules are made to be broken*, which illustrates the rebellious or – alternatively – experimental side of human nature.

16 Carrot jam should by no means be regarded as a radical example of category mixing, especially if one takes into account bacon or garlic ice-cream.

17 Rhubarb stalks, to be more specific.

18 Interestingly, the directive also includes vegetable-like fruits, such as tomatoes, cucumbers, pumpkins, melons and water-melons (*Council Directive 2001/113/EC*), apparently because of their dubious status. Following this train of thought, we may – with a pinch of salt – define such a food item as “a fruit which is used as a vegetable which may be used as a fruit.”

of food – is derived from a specific part of a plant, in the case of the latter we can only say that it is *some* part of a plant, usually, but – as the example of the tomato shows – not always, other than fruit.¹⁹

4. Concluding remarks

Although the classical approach to categorisation may be useful for describing the outside world, our interpretation of it – as we have seen – apparently complies with the prototype approach, despite our deeply ingrained longing for order. As for the tomatoes, surely nobody expects consumers to go to a greengrocer's or a supermarket – having learnt that they are fruit – and demand their relocation to the proper category. After all, as observed by the British journalist, musician and broadcaster, Miles Kington (2003), “knowledge consists of knowing that a tomato is a fruit, and wisdom consists of not putting it in a fruit salad.”

References

- Ayto, John (ed.) (1993) *The Diner's Dictionary: Food and Drink from A to Z*. Oxford: Oxford University Press. (DD)
- Berlin, Brent, Paul Kay (1969) *Basic Color Terms: Their Universality and Evolution*. Berkeley: University of California Press.
- Bernard, Catherine (2013) *The Substantive Law of the EU: The Four Freedoms*. Oxford: Oxford University Press.
- Council Directive 79/693/EEC of 24 July 1979 on the approximation of the laws of the Member States relating to fruit jams, jellies and marmalades and chestnut puree.
- Council Directive 2001/113/EC of 20 December 2001 relating to fruit jams, jellies and marmalades and sweetened chestnut purée intended for human consumption.
- Heider, Eleanor (1971) “Focal' Color Areas and the Development of Color Names.” [In:] *Developmental Psychology* 4; 447–455.
- Heider, Eleanor (1972) “Universals in Color Naming and Memory.” [In:] *Journal of Experimental Psychology* 93; 10–20.
- Janick, Jules, Robert E. Paull (eds.) (2008) *The Encyclopedia of Fruit and Nuts*. Cambridge, UK: Cambridge University Press. (EFN)
- Lewis, Charlton T., Charles Short (eds.) (1879) *A Latin Dictionary*. Oxford. Clarendon Press. (LD)
- Mauseth, James D. (2009) *Botany: An Introduction to Plant Biology*. Sadbury: Jones and Bertlett Publishers.
- McIntosh, Colin (ed.) *Cambridge Advanced Learner's Dictionary*. Cambridge, UK: Cambridge University Press. (CALD)
- Nix v. Hedden* (1893) 149 U.S.; 304.
- Palmatier, Robert A. (ed.) (2000) *Food: A Dictionary of Literal and Nonliteral Terms*. Westport, CT: Greenwood Press. (FDLNT)
- Rosch, Eleanor (1975) “Cognitive Representations of Semantic Categories.” [In:] *Journal of Experimental Psychology* 104 (5); 192–233.

¹⁹ This may be the stem (asparagus), root (beets, carrots, radishes, etc.), leaves (cabbage, lettuce, rhubarb, spinach, etc.), tuber (potatoes), bulb (garlic, leeks, onions) or flower (cauliflower, broccoli).

- Sauer, Jonathan D. (1993) *Historical Geography of Crop Plants: A Select Roster*. CRC Press.
- Simpson, John A., Edmund S. C. Weiner (eds.) (2009) *Oxford English Dictionary Second Edition on CD-ROM*. Oxford: Oxford University Press. (The OED)
- Smith, Andrew F. (1994) *The Tomato in America: Early History, Culture, and Cookery*. Columbia: University of South Carolina Press.
- Tokarski, Jan (ed.) (1980) *Słownik wyrazów obcych*. Warszawa: Państwowe Wydawnictwo Naukowe. (PWN)
- Tredennick, Hugh (1933) *Aristotle, Metaphysics*. London: Heinemann.
- Wittgenstein, Ludwig ([1953] 1978) *Philosophical Investigations*. Transl. by Gertrude E. M. Anscombe. Oxford: Basil Blackwell [New York: Macmillan Publishing Company].

Online sources

- Encyclopaedia Britannica* (2016). Available at: <http://www.britannica.com> [ED 1.09.2016]. (EB)
- Harper, Douglas (ed.) (2001–2016) *Online Etymology Dictionary*. Available at: <http://www.etymonline.com> [ED 1.09.2016]. (OLED)
- Kington, Miles (2003) “Heading for a Sticky End.” [In:] *The Independent*, 28.03. Available at: <http://www.independent.co.uk/voices/columnists/miles-kington/heading-for-a-sticky-end-112674.html> [ED 1.09.2016].
- Trésor de la Langue Française informatisé*. Available at: <http://atilf.atilf.fr/dendien/scripts/tlfiv4/showps.exe?p=combi.htm;java=no>; [ED 1.09.2016]. (TLFi)