

Web Appendix

for

Some simple economics of GM food

by

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APPENDIX B. PATENT DATA

The US patent data was gathered from the USPTO website. The following procedure was used to isolate ‘GM food’ patents:

1. Based on the descriptions provided by the USPTO, likely patent classes and subclasses were selected. This subset was made up of: 260, 424, 426, 435, 436, 532–570, 800, 930, PLT (plants).
2. Each class and subclass in the subset was explored further by looking at the titles of the patents that they contain and by consulting the full text of a sample of patents. Based on this, the subset of likely classes was further narrowed down to: 435/440 and 800/278–279–280–296–298–299–300–301–302–303–304–305–306–307–308–309–310–312–313–315–316–317–318–320–322.
3. For each of the subclass, all patents from 1985 onwards were examined in two stages. In the first stage, all patents with a title clearly ruling them out were discarded. The full text of every remaining patent was consulted before deciding whether or not it would be counted as a ‘GM food’ patent.

The criteria used to determine the ‘GM foodness’ of a patent were that some actual or potential application to consumable crops or food had to appear in the claims and that the patent had to involve a genetic engineering process. This, for example, excludes non-food crops like tobacco or cotton. It also excludes new crops obtained through cross-breeding techniques even if some of the organisms being bred were themselves genetically engineered (and claimed as such in another patent). New varieties obtained with the aid of genetic ‘markers’ were not retained either.

The scope of our definition is therefore quite narrow. It should capture most of the patents directly related to the production of GM crops with food applications. On the other hand, we certainly have missed patents on genetic engineering *methods* that can be of great importance in the development of food-related GM crops. We would only catch these methods if (potential) applications to relevant crops were mentioned in the patent claims.

While dimensions such as date of patent grant and patent assignee are quite clear-cut, others like the types of plants and traits involved are not. For example, most patents claim the application of a given genetic modification to a large number of plants, even if only some of them have actually been modified. In our data set we tried to draw a distinction between primary applications and secondary ones. Primary applications apply to plants that are mentioned in the abstract of the patent. Results reported in the text include both primary and secondary applications. The breakdown is available on request. The traits that a patent claims to modify can also be hard to classify. Is a ‘modification of the sugar content’ of a fruit a change in its nutritional content, a change in taste or a change in the ripening process? Whenever serious doubt remained we chose to assign each of the possible traits to the patent.

The European patent data were obtained using publicly available patent family information from the Delphion server (<http://www.delphion.com>). We attempted to match each US patent with an EPO application of equivalent content. To do so, we inspected the titles, abstracts and, in some cases, the claims of the documents. Patent applications for such equivalents were identified in 250 cases (out of 355 granted US patents).

In only 43 of these 250 cases had the patent been granted by May 2001. The reason for this discrepancy is apparently the slow pace of patent examinations at the EPO. In order to come up with reasonably comparable figures, we employ the data on EPO patent applications rather than granted patents to compute the statistics in Table 6. Since we start the analysis with relatively young USPTO patents and since the most valuable inventions are likely to take more time to be examined, it is not possible at this point to get a comprehensive picture of which EPO patent applications will ultimately be granted or not granted. Such an analysis must be left to future research.

The statistics in Table 6 would be seriously biased if important patents were submitted to the EPO, but not to the USPTO. In this case, they would not enter our EPO database. Interviews with patent attorneys revealed that this is very unlikely given the differential speed of patent examination and approval at the EPO and the USPTO. In order to check the validity of our results, we also compiled a list of all EPO plant-related patent applications (irrespective of whether they had or did not have a USPTO equivalent) that referred to a particular crop in the abstract. The concentration figures based on this approach are somewhat higher than the ones displayed in Table 6.