

Public perception of Biotechnology in Poland*

Renata Suchocka

Bolesław Suchocki

Jacek Tittenbrun

Institute of Sociology

Adam Mickiewicz University

Poznań

Research on public perception of biotechnology has in Poland virtually no tradition. With no previous comparable investigations to serve as a background, it seemed necessary to conduct a pilot or preliminary survey that could give one an idea of the degree of knowledge in the field which particular social categories have. It seemed reasonable to assume that because the discipline under consideration is still in its early stage, awareness of biotechnology should be — leaving aside its professional practitioners — greater among young people who alone had an opportunity to receive some information about biotechnology in the course of their education. To find out what the extent of this knowledge is, the authors have carried out the pilot survey among students of medicine. It has been assumed that these students whose prospective professional career will be influenced by biotechnology will not only have knowledge acquired in their formal process of education but tend to seek extracurricular information about biotechnology. If confirmed, this would make it possible to estimate the level of awareness of those less well-educated and having less to do with biotechnology. The results of the research turned out to be rather disappointing, however; although a technique of projection [i.e. one of spontaneous pronouncements] was used, a fifth of those surveyed were not in a position to express any opinion, frequently pointing to their lack of relevant knowledge, and the same percentage limited themselves to generalities such as “it’s a good thing that biotechnology develops well” or “biotechnology can be useful”.

The results of the preliminary opinion research confirmed the authors in their opinion that aside from “insiders” or those with a professional interest in biotechnology, it is only among the young generation, such as pupils in grammar school [secondary schools preparing for the university] that any sound knowledge about biotechnology can be found. Accordingly, the authors abandoned their original plan of conducting a survey of a representative

* The surveys were carried out by Art and Science Ltd.

cross section of the entire community and chose to concentrate on pupils in the grammar schools' final forms.

Perhaps a short methodological comment is in order. A sample representative of the whole population is not, of course, a prerequisite of a sociological study; in many cases it may be more fruitful to confine the inquiry to samples of particular sections of the population. The population to be covered must, however, be carefully defined and the sample selected so as to represent this particular population correctly and without bias. These conditions were fulfilled in the present inquiry as the individual forms were drawn by lot for the sample so as to select a representative cross section of all profiles or special subjects [similar to Britain's combined honours courses]. In sum, 400 individuals were thus selected. Such a sample is sufficient for making generalisations significant at 5 per cent probability level [with the margin of error amounting to 5 %].

The study was based on a questionnaire. The questionnaire consisted of three major parts: a "knowledge test", a number of questions concerning respondents' attitude toward some [actual and potential] applications of biotechnology and genetic engineering, and their background. Questions from Eurobarometer survey were also used.

The results of the study bore out the supposition about the lack in the school curriculum of a course which would convey a body of information on biotechnology and genetic engineering (1). This state of affairs accounts for the partial, unsystematic and incoherent character of the respondents' knowledge, which finds its expression in the survey's results. The questionnaire included series of questions arranged thus that a wrong answer to one question precluded the right answer to the next question. That this condition was fulfilled, was confirmed by authorities in the field. However, none of these assumptions proved correct in practice. For instance, while only 39.2% of those polled picked the right answer in the case of the question about the number of cells composing a hen's egg, the next question, concerning hemophilia, was answered correctly by as much as 81.4%. This can be explained by a lot of publicity given by the media to hemophilia in connection with AIDS. Similarly, when asked whether it is possible to detect Down's syndrome, much publicised in the media, during early pregnancy, 64% of those surveyed indicated the right answer, while as much as 56.4% agreed with the false statement: "Most microbes are harmful to human life" and, even more shamefully, just 17.7% knew that "a gene consists of a number of chemical substances common to all living organisms". Indeed it seems hardly an exaggeration to say that the respondents' knowledge is based on what hits the headlines.

The supposition as to the type of main information sources about biotechnology and genetic engineering as possibly accounting for the chaotic and haphazard character of the surveyed pupils' knowledge was corroborated by some further findings of the inquiry. Newspapers turned out to be the most important source of information for 37.5% of respondents, while, according to the survey, a further 55.3% use them as an additional source. The number

of those relying on television as their main or secondary source of information was also high; 27.0% in the former and 56.5% in the latter case. For magazines the respective percentages were 18.3 and 57.3%, for books — 17.1 and 44.2% and for professional journals just 5.6 and 27.2%. The problem is, treatment of biotechnological topics aimed at a popular audience, more often than not by journalists or reporters without much formal biological or other relevant training, often contains inaccuracies and instances of misplaced emphasis, doubtful interpretation, overdramatisation, oversimplification and too-sweeping generalisation. Sensationalism, of which not only the tabloids may be accused, can hardly contribute to enlightenment.

The above findings take on an added significance when compared to perceived credibility of information sources. Schools and universities scored the highest in terms of perceived credibility as information sources [they were indicated as the most reliable sources by 36.7% of those surveyed]. Apparently, the accessibility of knowledge transmitted by these institutions [including their popularising activities] is inadequate, or the surveyed persons' interest is too weak to make these institutions more attractive sources of information than TV or newspapers are. Interestingly enough, although a large majority of those polled described themselves as Catholics, and despite the fact that genetic engineering is obviously ethically sensitive, religious organisations scored very low, with only 1.4% of those polled choosing them as the most credible source of information. (Similarly, the teaching of the Church was indicated as the main source of information by merely 0.8% of respondents and as a secondary source by 13.4%).

As far as knowledge of biotechnology is concerned, its level turned out to be generally low. Specifically, the distribution of those surveyed by percentage of right answers given by them was as follows:

- 0 – 25% — 17.9%
- 25 – 50% — 41.5%
- 51 – 75% — 34.9%
- 76% and more — 5.7%

The differences in the results of the knowledge test are not explained by respondents' social characteristics; no statistically significant relationship between any of the variables distinguished and the percentage of correct answers was found.

Prior to the research it seemed that it is precisely the level of understanding that will determine the respondents' declared attitudes towards biotechnology applications. It seemed plausible to assume that those opinions and views which are grounded on solid knowledge will differ from those based on stereotypes and preconceived notions. This assumption was not borne out by evidence, however.

Respondents were asked a number of questions which were supposed to provide information differentiating their attitudes according to the sphere and subject of application. Two domains of activity were distinguished: scientific uses and mass applications in everyday life. These were crisscrossed with

the four subjects to which biotechnology and genetic engineering are most commonly applied: microorganisms, plants, animals and humans. In each case respondents could describe their attitude as one of full and unqualified approval, approval hedged about with qualifications, or lack of approval. They could also avoid taking a stance.

The analysis of responses shows two persistent tendencies at work: the level of approval is the less the more complex are the organisms in question (1), and the higher — in a statistically significant way — approval for activities within the confines of science than for those which affect everyday practice. Let us illustrate the patterns found with some figures. 49.2% of those surveyed accept fully and without reserve the application of biotechnology and genetic engineering to microorganisms both in research laboratories and in everyday life, but only 5.0% does so in reference to humans. When the differences between laboratory research and mass applications are taken into account, the respective percentages are: in the former case 61.2% for microorganisms and 8.9% for humans, and in the latter one 58.4% and 6.9%.

Similar patterns were found in the case of individual applications of biotechnology and genetic engineering. The extreme levels of approval and disapproval concern, again, microorganisms on the one hand and human beings on the other. The use of microorganisms in drug development on a laboratory scale was fully approved by 88.1%, and on an industrial scale by 80.8%; their use in waste treatment by 88.3% and 78.2% respectively; and in food products — by 64.6% and 60.5%. Among the applications of biotechnology directly relevant to human organisms, treatment of genetic diseases scored the highest in terms of the rate of approval [61.4% in the case of scientific experiments and 49.9% in the case of mass-scale applications]. For prenatal screening the respective percentages were: 34.9% and 29.9%; for diagnosis of outstanding abilities and sinister qualities of people: 28.2% and 22.1%; and for creation of mutants: 8.9% and 7.1%.

It will be recalled that so far we have dealt only with those responses which expressed outright approval. In addition, however, there were many respondents who were well-disposed towards biotechnology and genetic engineering while having some doubts as to their certain applications. The overall attitude of these persons towards biotechnology is based on a more specific and varied opinion on those developments as seen through the prism of their, mostly moral, values.

It is clear from the foregoing that the young have mixed feelings about biotechnology. This is hardly surprising in the light of the nature of their main sources of information which is moreover always selectively received and interpreted on the basis of pre-existing values, beliefs, prejudices etc. What may seem to be more peculiar is that these varied attitudes are not accounted for by either the level of knowledge as measured by our test of knowledge or by social characteristics of those studied. In this regard no statistically significant correlation was found. It seems that these surprising

at first sight findings are due to the specific nature of the knowledge in question. Opinions and views of the youth reflect conventional wisdom with all its inherent stereotypes and preconceptions rather than scientifically grounded knowledge. Arguably, such high-quality and coming from more reliable sources information could have a more significant effect on attitudes towards biotechnology. On the other hand, the fact that the overwhelming majority of subjects draw their knowledge about biotechnology from the media, with all their inherent limitations as sources information, overrides the effect of any differences in the subjects' background.

Summing up, the lack of relationships which would explain the variations found can be considered as a result of the fact of considerable homogeneity of the sample, i.e. of there being more similarities than differences in many important socioeconomic and demographic characteristics of those surveyed as well as from the inefficiency of the system of knowledge dissemination or popularisation which should stimulate the development of individual interests while simultaneously providing reliable information and materials to be used as building blocks of attitudes, judgments and opinions. This inserts a dose of optimism into what may appear as rather depressing picture in that there seems to be plenty of room for improvement in the above field. The importance of this field is difficult to exaggerate as "numerous sociological studies have revealed that (...) education encourages the acceptance of new forms of technology and ways of organising social institutions. The more extensive people's exposure to science is, the more they are willing to accommodate new ideas" (2, 3)

References

1. Houwink E.H., (1989), *Biotechnology. Controlled Use of Biological Information*, Dordrecht, Kluwer Academic Publishers, 103.
2. Grindley J.N. and Bennett D.J., (1993), *Public Perception and the Socio-Economic Integration of Biotechnology*, *Biotechnology*, 1(20), 7 - 20.
3. Schaefer R.T., (1983), *Sociology*, New York, McGraw-Hill, 408 - 409.

Odbiór społeczny biotechnologii w Polsce

Streszczenie

Badania odbioru społecznego biotechnologii nie mają długiej tradycji w naszym kraju. W artykule przedstawiono pierwsze polskie badania socjologiczne przeprowadzone na studentach i uczniach szkół średnich. Prace wykazały wysoką akceptację społeczną biotechnologii przy bardzo niewielkiej znajomości merytorycznej problemu.

Key words:

biotechnology, Poland, public perception.

Adres dla korespondencji:

Renata Suchocka, Bolesław Suchocki, Jacek Tittenbrun, Institute of Sociology, Adam Mickiewicz University, ul. Szamarzewskiego 89, 60 - 589 Poznań.