Chapter 1

Guide to Interpreting Data

The following summary highlights the main points to consider when analysing the Biotechnology Survey 2005 results. A full technical description is contained in chapter 10.

Definition of biotechnology

The definition of biotechnology used in the Biotechnology Survey 2005 was the working definition used by the Organisation for Economic Co-operation and Development’s (OECD) Biotechnology Statistical Framework (refer www.oecd.org).

The OECD defines biotechnology as “the application of science and technology to living organisms as well as parts, products and models thereof, to alter living or non-living materials for the production of knowledge, goods and services”.

The following list of techniques was published by the OECD in 2005 as an interpretative guideline of what biotechnology includes:

- **DNA – the coding**: genomics, pharmaco-genetics, gene probes, DNA sequencing/synthesis/amplification, genetic engineering
- **Proteins and molecules – the functional blocks**: protein/peptide sequencing/synthesis, lipid/protein glyco-engineering, proteomics, hormones and growth factors, cell receptors/signalling/pheromones
- **Cell and tissue culture, and engineering**: cell/tissue culture, tissue engineering, hybridisation, cellular fusion, vaccine/immune stimulants, embryo manipulation
- **Process biotechnologies**: bioreactors, fermentation, bioprocessing, bioleaching, bio-pulping, bio-bleaching, biodesulphurisation, bioremediation, and biofiltration
- **DNA and RNA vectors**: gene therapy, viral vectors
- **Other**: bioinformatics, nanobiotechnologies, other.

Data collection

The Biotechnology Survey 2005 was conducted as a postal survey of all known New Zealand organisations that were thought to be involved in biotechnology. There were 401 forms posted out and a response rate of 93 percent was achieved. Further information on the selection of the population can be found in chapter 10.

The majority of the questionnaire uses a two-year reference period. Financial information was requested from respondents for the 2005 financial year. A copy of the questionnaire can be found at the end of this report.

Comparison between 2004 and 2005 surveys

A number of changes have taken place between the running of the 2004 and 2005 surveys. The key changes are described below.

For any questions not relating to the last financial year, the reference period has changed from the three-year period used in the Biotechnology Survey 2004, to a two-year reference period in the Biotechnology Survey 2005. This coincides with the survey becoming biennial from 2005.

In 2005 a new framework was used to determine the areas of application of biotechnology techniques being used. This framework is based on the work of the Ministry of Research, Science and Technology, and New Zealand Trade and Enterprise. For this reason, no comparisons can be made with the previous years’ data.

The Biotechnology Survey 2005 now captures data specifically on biotechnology commercialisation (new products/services introduced to the market).
As well as measuring constraints on research and development, as in 2004, the Biotechnology Survey 2005 also identifies constraints on biotechnology commercialisation.

Caution needs to be taken when making comparisons between data from the Biotechnology Survey 2004 and the Biotechnology Survey 2005, particularly due to the change in reference periods.

**Presentations of numeric totals**

In order to preserve the confidentiality of respondents, counts used for this report were random rounded to base 3. When data in a table has been randomly rounded to base 3, every value in the table is a multiple of 3. The probabilities of rounding up or down are set so that in the long run the expected value, after rounding, equals the original count. The randomness of this kind of rounding may result in a total which differs slightly from the sum of the individual cells contributing to this total.

Numeric data that was not released in the Hot Off The Press publication in April 2006 has been randomly rounded to base 5.