

# Profits in Innovation

The pharmaceuticals market in Japan continues to expand, as exemplified by a provisional 7.2% growth in production values in the first half of 1988 compared with the same period the previous year. The latter half of the year was expected to see a slower growth in production values because the government's official price reduction, effective from April 1988, affected the industry's sales. The sales are believed to have increased over the year as a whole, however.

The Ministry of Health and Welfare lowered official prices, primarily for antibiotics, by 10.2% (for antibiotics, by 18%) last April. It was the first double-digit price reduction since 1984. But the Japanese people's expenditures on medical treatments will likely increase at a faster rate than their income in fiscal 1988, according to the ministry. Demand for medical services, especially from aged people, is strong. In addition, drug producers have been marketing a number of major new pharmaceuticals since mid-1987, while the ministry now sets drug prices four times a year. All these contribute to production value increases.

As a result, major drug companies were expected in 1988 to maintain favorable business performances similar to 1987, when a lack of official price cutting helped them achieve better sales and earnings. A plus in 1988 was increases in sales and production, which lowered the ratio of fixed costs to total costs.

The industry should continue to enjoy a boom. For one thing, the ministry's

next official price reduction is not expected to take place until 1990.

In the medium and long term, technological innovation and internationalization will be important. Innovation will center around increasing drug commercialization based on biotechnology. Also increasing is the number of laboratories and factories constructed by major Japanese producers in the U.S. and Europe. Just like foreign companies' increasing presence in Japan, Japanese companies' overseas operations are aimed at increasing chances of new drug development as well as recovering development investments in global markets.

The products of biotechnology still have extremely meager markets. But the number of commercial bio-products has been increasing. This is attributed primarily to aggressive biotechnology investments by major drug makers in the past. The government has helped the industry, too. Genetic engineering safety guidelines have been formed and issued by the Ministry of International Trade and Industry, the Ministry of Health and Welfare, and the Ministry of Agriculture, Forestry and Fisheries.

Biotechnology's major applications and commercializations have been for such pharmaceuticals as insulin, human growth hormone and alpha-interferon, which were developed on the basis of basic foreign technology. In 1988, though, Japanese indigenous technology created a commercial vaccine for hepatitis B. Producers also won production approval for,



Major drug companies are expected to enjoy a continuing boom.

among other things, EPO (erythropoietin; used to produce blood) and TPA (tissue plasminogen activator; for dissolving blood clots).

In the food industry, bioreactors are utilized for the production of sweeteners. Also, soy sauce and liquor companies managed to shorten production periods—at least in their laboratory experiments. This technology is expected to be used on a commercial basis in the near future. Consumers are already buying decorative plants and vegetables to which biotechnology has been applied, while attempts are being made to apply biotechnology to agricultural chemicals, like BT (*Bacillus thuringiensis* Berliner) agent.

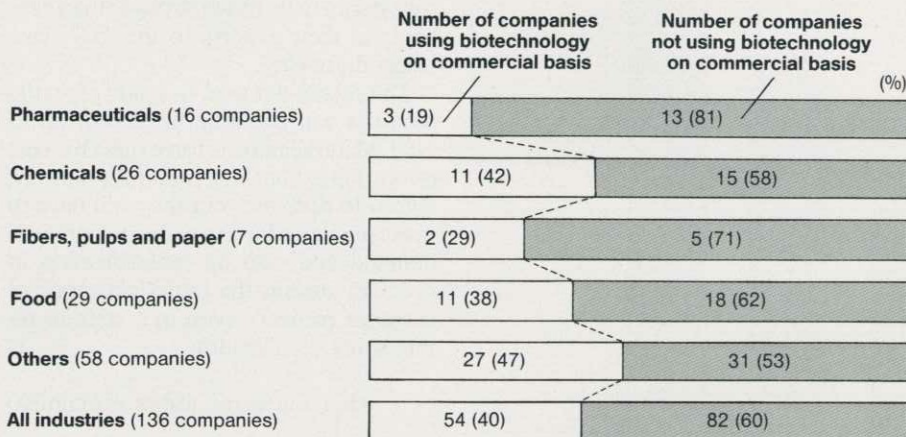
Scientists envisage an even wider range of applications, including marine biotechnology and neuro-computers and other fields of information processing.

Leading companies generally maintain a strong interest in research and development projects, as shown by construction of research centers for specific projects. But at the same time companies are giving up increasing numbers of projects on the grounds of higher-than-anticipated development costs and a lack of substantial markets. As a result, cooperation between companies has become a common method to help reduce risks in development and shorten time required for commercialization. Japanese companies have also increased cooperation with U.S. venture firms and other foreign companies as well as research institutes outside of Japan.

The products that have so far been commercialized represent the use of quite rudimentary biotechnology. The nation's biotechnology R&D efforts are likely to become even more active, however, accelerating the commercialization of products.

(Masao Mori, economist)

## Commercial Application of Biotechnology



Note: Figures in parentheses represent percentage.

Source: "Report on the R&D Infrastructure for Biotechnology (1987)", The Bioindustry Development Center