an economic subcommittee as part of an advisory committee to the Science Policy Studies Center in the director's office. And the new NIH Strategic Plan calls for additional studies to "help NIH demonstrate and communicate the tangible benefits that can be traced to biomedical research. The information will be especially useful to the NIH leadership...in justifying [NIH's budget] request before Congress."

This new role does not come naturally to most biomedical researchers. Until recently, many feared that making an economic argument for basic biomedical research could lead to a shift toward applied research in which the payoff is even more obvious. When ASCB embarked on its economic analysis effort, says Marincola, "we heard from individual members who said that it embarrassed them that we'd been called down on this dirty playing field." Healy had the same experience during her 2-year effort to create a vision for the agency that included a role for economic analysis. "If there was one component of the Strategic Plan where we struggled the most with the scientific community," she says, "it was the issue of NIH's contribution to the nation's well-being. The scientific community was overwhelmingly resistant to emphasizing that."

Scientists' caution reflects the fact that cost-benefit analyses can be a two-edged sword. Earlier this year, Senator William Roth (R–DE) attempted to attach language to a bill reauthorizing NIH that would have required grant reviewers to consider, along with the scientific merit of a proposal, its potential to "increase the productivity of health care," a measure that includes its impact on costs. Although the provision was eventually removed, a compromise was struck requiring NIH's parent agency, HHS, to study methods in which the NIH scientific peer-review process could be changed to reduce health care costs. The department is negotiating with the IOM to carry out such a study, and the Senate Labor and Human Resources Committee plans to hold hearings on the issue next year.

The use of economic studies to prove the value of biomedical research, although a radical step, is not unprecedented. A cadre of economists have been trying for years to measure the benefits of basic research, but their efforts have not been very persuasive, says Burton Weisbrod, director of Northwestern University's Center for Urban Affairs and Policy Research. "Nobody's thought these things through enough to give a considered answer," he says.

One problem is that such studies are imprecise and open to alternative calculations. Innovations in basic research rely upon countless previous advances, and it is difficult to know how far back to trace the investment. It is equally hard to identify the products that may come from one breakthrough. Some groups doing such studies use citation analysis and other bibliometric techniques to trace the trail of innovation; others survey experts. Neither way is perfect, says James Schuttinga, an NIH economist.

There is also no consensus on so-called secondary benefits, such as the economic windfall to businesses supported by the manufacturer of the technology itself. In its study, FASEB used a "multiplier" calculated by the Department of Commerce that doubled its estimated benefit-cost ratio for monoclonal antibody-based HIV tests. NIH, on the other hand, does not factor in secondary benefits.

The studies also have their skeptics. Former House science committee chairman Don Fuqua once scoffed at the grand claims made for research's long-term payoff by noting, "If that were true, we could put all our money into research and eliminate the national debt." In addition, the success stories of known winners—in the case of monoclonal antibodies, including even a Nobel Prize—can hardly be applied to all of basic research. Indeed, in 1986 the congressional Office of Technology Assessment answered a simple no to the question posed by a report titled "Research Funding as an Investment: Can We Measure the Returns?"

But researchers seem determined to press on despite the odds. A lot more work needs to be done before the argument that basic biomedical research is good for the economy can rest on anything more substantive than faith. The big question is whether the political process can wait for a better answer.

–Christopher Anderson

EUROPEAN BIOTECH

Thumbs Down for Cattle Hormone

The European Community's (EC) executive, the European Commission, last week angered the biotechnology industry by proposing a 7-year ban on the use of bovine somatotrophin (BST)—a genetically engineered hormone that increases milk yields in cattle. The proposed ban has nothing to do with safety concerns. Instead, the commission wants to keep BST off the market because it could undermine the EC's efforts to reduce farm surpluses.

Industry sources say the unprecedented proposal to ban a product on economic grounds creates a climate of uncertainty that will drive biotech investment from the EC. The industry is already smarting over tough new rules on genetic engineering adopted by the EC in 1990, and the proposed BST ban is "another nail in the coffin," says Brian Ager of the Senior Advisory Group on Biotechnology (SAGB), a Brussels-based industry lobby group. For Eli Lilly and Monsanto, the U.S.-based multinationals that produce BST, the situation is particularly galling: In January, the two companies won a 5-year battle to prove that BST is safe and effective, when the commission's Committee on Veterinary Medicinal Products ruled that there is no scientific case for banning BST.

Monsanto and Lilly will now try to convince agriculture ministers from the 12 EC states—who will consider the commission's proposal in the fall—that they should oppose the ban. The companies' lobbying effort is likely to focus on the commission's economic analysis, which concludes that the widespread use of BST would increase milk production enough to lead to the slaughter of 4% to 6% of dairy cattle in the EC, given current milk quotas—a development that would add to beef surpluses. But Ken Baker, director of public policy with Monsanto Europe, claims that these calculations are flawed. In countries such as Brazil, where BST is on sale, he says, the hormone is used by a minority of farmers as a "management tool" to even out yields over the year, rather than to achieve large overall increases in production.

If the ministers can't be won over, the result will be a policy paradox: BST will be made by U.S.-based companies in the EC, where it can't be sold, largely for export to the United States, where it probably will be on the market soon. Both companies have set up BST plants in Europe—Lilly near Liverpool in England; Monsanto near Innsbruck in Austria, which is moving toward EC membership. The U.S. Food and Drug Administration should deliver its verdict on BST any day now, and as it is limited to considering safety and efficacy questions, most observers expect the hormone to be approved for sale in the United States.

The biotech lobby fears that the commission's opposition to BST will make large investments in European biotech a thing of the past. But some observers, such as Mark Cantley who follows biotech policy for the Organization for Economic Cooperation and Development, believe that the commission's action should not necessarily be viewed as a precedent. They point out that in 1990, commission agriculture and environment officials were pressing hard for socioeconomic criteria to be applied routinely in the evaluation of biotech products (*Science*, 7 June 1991, p. 1366). But that idea was thrown out in a high-level commission document published in 1991. EC farm commissioner Rene Steichen has now successfully argued that BST is an exceptional case, but Cantley predicts that biotech opponents won't be able to play the same card again any time soon.

–Peter Aldhous