Choice of Research Priorities by Public and Private Sector Scientists and Research Administrators

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3 data sets

In-person interviews, selected purposefully, with:

1. 10 ARS scientists and scientist administrators.
   a. Bovine Quantitative Genetics & Genomics
   b. Water Quality and Watersheds.
   c. ARS Nutrient Databank Laboratory.
2. 84 university agricultural scientists with an emphasis on agricultural biotechnology. Biological scientists working on agriculturally relevant topics (randomly selected 10).
3. 63 industry research managers and scientists at agricultural biotechnology firms (randomly selected 10).

Data Collected

- Definitions of Public Good and how research in their area of specialization contributed to Public Good.
- For Industry, asked how University research, as compared to industry research, contributed to Public Good.
- Likert scales on Criteria for Research Problem Choice for three groups.

Comparison of Criteria for Research Problem Choice: ARS, University and Industry Scientists (1= Not Important; 7 = Very Important) N= 30

	Organization Type & Scale Means			Significance (P < 0.10)		
Criteria	**ARS**	**University**	**Industry**	**ARS-Univ.**	**ARS-Indus.**	**Univ.-Indus.**
Contribution to Scientific Theory	5.9	5.4	2.7		Yes	Yes
Creation of New Methods & Tools	6.0	5.1	5.6			
Marketability of Final Product	5.7	3.7	6.9	Yes	Yes	Yes
Public Sector Funding Availability	6.2	5.0	3.5	Yes	Yes	Yes
Private Sector Funding Availability	4.4	4.0	5.2			
Journal Publication Probability	6.1	5.6	3.6		Yes	Yes
Contributing to the Public Good	6.7	5.1	5.5	Yes	Yes	
Satisfying Scientific Curiosity	4.9	6.0	4.2			Yes
Potential to Patent and License Findings	3.4	2.8	6.1		Yes	Yes

Serving The Public Good.

University: Basic Science

- *We [university scientists] are the leaders in terms of developing new concepts and so forth… there's a lot of frontier breaking that comes from the private and public universities.*

- *We've discovered some pretty fundamental genes on which people now work.*

- *[University] Research should be anticipatory and ahead of curve.*

University:…basic Science

- *We [university scientists] lay the foundation for advancements in medicine and society in general.*
- *It has been proven time and again. Basic research comes out of universities [and] develops whole new fields: genomics, transistors, everything.*
- *The public good includes things like scientific curiosity [and] intellectual endeavors.*
- *Curiosity-driven research supports the public good.*

University: Information and Education

- *Another one is just education. You educate people to be better citizens.*
- *To test assertions that are being made by the scientific community about the value of particular types of research investments.*
- *The public depends on the university to evaluate all sorts of information.*
- *Expanding public knowledge- so education.*

Industry Perspectives: Public Good

- *In our business, it's a set of products that is safe, nutritionally sound, and needed by the public.*
- *Creating products that create jobs, that create value for society, and for the people involved. As well as enabling technologies that could be used for a lot of applications.*
- *My understanding of [the] Public Good is [it is served by developing] technologies [with] societal value.*

Industry Perspectives: University Role as Providing Basic Research

- *The university are best at, and should be producing, fundamental research that can be applied by a company. That should be their primary role.*

- *… part of it is developing scientific expertise and advancing knowledge. Serving needs, particularly in areas that are not addressed by commercial interests.*

- *there's a lot that's going to come out of the university from just a basic understanding, you know, basic research into processes by which plants and animals interact, and the biochemistry and the molecular biology of how plants do their thing and how animals do their thing*

Industry Perspectives: University Role as Product Tester

- *And [university scientists] are a very important step in the process of information flow about a technology that's critical for the farmer/customer to trust and value the technology. They trust the university source more than they might industry. It's also very important from a regulatory perspective, because increasingly regulators [look] to university scientists who are engaged in these biotech programs for information, advice, and for conclusions.*

- *I think the role that universities play in testing products once we bring them to market is critical to providing abundant and healthy food.*

ARS: Serving the Public Interest through Data Provisioning

- *The public actually drives benefit from the research. We are not seeking patents licenses, and protective arrangements so that the public has full access and full use of the research. [For example] many of our water models are the standards for the world none of them are copy-written. [Anyone] can access [them]. They are public goods [or] public services. We'll even give you the source code.*

ARS:…data Provisioning

- *You have the people within the watershed making management decisions. You have the larger public downstream. [ARS scientists] have to figure out how all of these people fit together [so that the larger public good is served].*

- *We provide the underlying nutrient composition data of food and those data are publicly available to everyone. [The data] is used by the general population and people in high risk groups. The FDA uses it to facilitate the regulation of the food supply; and [entities] that import food from the US can use the food composition data.*

ARS: Serving the Public through Longer-term Applied Research Horizons

- *The planning horizon for beef cow [research] is five to six years. So most of the experiments we plan have a commitment of more than five years.*

- *In Genetics and Genomics it is necessary to maintain large animal populations over a long period of years. [These types of facilities] are very expensive to maintain. [And Congress has agreed to continue this high level of investment to serve the industry].*

ARS: Facilitating Product Development in Private Sector

- *We are producing products and working at developing products that effect all levels of production. Genetics tools that [producers] can use and from which they can benefit.*

- *The thing that drives me is building a better dairy cow. Generating research for the public good [means research that benefits] the dairy producers and the consumer in the long run.*

ARS:…product development

- *My goal is to provide producers in the U.S. with data and technology they need to make selection decisions tomorrow, so [the U.S.] does not lose its status as international leader in [bovine] genetics.*

- *If you were a software developer you could [use] our [nutrient data base] website and…create your own application and become rich.*

Constructing Research Ideal Types

- ARS and University more similar to each other than to industry.
- Industry more applied than ARS which is more applied than the University.
- ARS and Industry more likely to value links to marketability of a product than the University.
  - Industry wants to develop and patent products for the market.
  - ARS interested in enabling product development within the private sector.

Ideal Types…

- ARS scientists more likely to be serving public interest directly, through development of knowledge and applications than the University or Industry.
- ARS and University scientists more interested in publishing in scholarly journals than Industry scientists.

Ideal Types…

- University scientists more oriented toward basic research and satisfying scientific curiosity.
- University and Industry view basic science as the University's 'comparative advantage' and appropriate societal role.
  - Concern that this role was being threatened by shift toward academic capitalism or academic entrepreneurialism.

Competing & Complementary Research Demands on A.R.S. (N = 10)

Criteria for Research Problem Choice	Very Important	Important	Somewhat Important	Total
Industry Demands	4	4	1	9
Administration Demands	5	2	2	9
Congressional Demands	2	4	1	7
Civil Society Demands	1	2	3	6
Address Market Failure	5	3	1	9
Address USDA Mission	6	3	1	10
Coordinate or Drive Industry Research/Actions	0	3	3	6