



# Kansas Bioscience & Innovation Roadmap

## Animal Science Hot Team Business Plan

30-Mar-2005

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### **The initiative**

Kansas will establish a **Fusion Center** to enhance its reputation and become a global hub for the advancement of **animal health** and **food safety** knowledge and technology. The Fusion Center shall be recognized as an institution of excellence that provides direction, education, advocacy, research collaboration, and support. To help individuals and businesses in Kansas be successful, the Fusion Center will seek to commercialize food safety and animal health research and technologies. The Bioscience Authority, the State Legislature, private industry, the citizens of Kansas, and others around the region and world will look to this Fusion Center for leadership.

### **Long-term goal**

The Fusion Center will be an entity recognized as a global resource for knowledge, information and other intellectual and experience-based assets relative to animal health and food safety issues. Not only will the Center be a repository for some of these assets, but it will also develop relationships with academia, government and industry, drawing on their resources. The Center will expand beyond animal health and food safety matters as issues are identified and funding is made available. The Center stands ready to support other hot teams' business plans.

### **The need**

Food safety represents an increasingly important area of the Kansas economy. As a supplier of wheat, meat, and a range of other food products, Kansas' health and wealth depends, in part, on food safety. Similarly, the health and productivity of animals used in production agriculture has a tremendous impact on the state's economy. Currently there is an unmet need to bring together industry, government, and academic expertise for the purposes of (a) synthesizing informational products from existing resources on animal health, food safety, and cross-cutting issues and (b) developing concerted strategies to commercialize key intellectual property. The Center will address this need. In consequence, Kansas will become a global bio-industry leader in disseminating integrated food safety and animal health information, identifying critical research needs, and facilitating the commercialization of key intellectual property and technologies.

### **Assets—current and future**

Current key assets include existing industry, government, and academic programs, resources, and grants. Existing research assets within Kansas make the state a global node for food safety and animal health research. Kansas also has several major (global) animal health businesses, colleges and universities with major investments in advancing agriculture, and a significant industrial community of animal and food production and processing operations. The "raw material" for the Fusion Center venture—that is, the requisite animal health and food safety talent base—already exists in Kansas. Additional human resources (e.g., Fusion Center staff, international and domestic subject matter experts, etc.) and facilities will be necessary in the future to maintain global-node status and, perhaps, reach global-hub status.

Considerable existing assets in Kansas are elaborated in Appendix A (in draft and forthcoming from the Animal Sciences Hot Team). Future assets (to capitalize on existing expertise and

resources) include, but are not limited to, the Fusion Center itself, the Biosecurity Research Institute (BRI) at Kansas State University (KSU), and a planned Tele-Veterinary Medicine System (a sensor-based real-time surveillance system).

## **Impact on innovation lifecycle**

The Fusion Center concept is well suited to the innovation lifecycle of conception-formation-growth-maturity. Expertise in Kansas would serve as the initial core to activate an asset “clearinghouse.” Fusion Center activity would be facilitated by a full-time, academically qualified and experienced team that would craft integrated, interdisciplinary responses to issue-oriented problems and questions by identifying the current state of knowledge relative to an issue as well as knowledge gaps (i.e., research needs). As academic resources increase, knowledge creation will escalate, thereby spawning food safety and animal health technologies and solutions which will be commercialized through the Fusion Center. As food safety and animal health research in Kansas transitions from global-node to global-hub status, Kansas thought leaders will develop clusters and networks with regional and global research centers and companies. The Fusion Center will serve as a hub of information, expertise, contacts, and knowledge that will feed the innovation lifecycle.

## **Impact on innovation attributes**

### **Increasing intellectual, human, financial, and social capital**

The Fusion Center will (a) synergize the expertise in Kansas and beyond, (b) strengthen Kansas’ current livestock and related food industry economic base and (c) encourage the infusion of enterprises to grow the economy of Kansas. The Center’s major impact will be to increase intellectual and human capital within Kansas companies and institutions in the areas of (a) food safety and animal health research and (b) technology and information transfer. As the Fusion Center is recognized as the focal point for managing the process of determining research needs and identifying commercialization partners, additional entrepreneurs (human and financial capital) will be attracted to invest in food safety and animal health technologies and solutions. This will lead to new and safer products that will result in enhanced social capital (for both humans and animals). Assets such as the BRI and the Tele-Veterinary Medicine System will (a) help provide a safer animal food chain and (b) reduce costs due to the spread of diseased animals and products derived from diseased meat.

## **Implementation strategy**

### **Champions and organizational “home”**

The Fusion Center, which will serve as the organizational home for implementation, will be established by a cooperative triumvirate of industry, academia, and government representatives who will assemble the assets, which will be the core of the Fusion Center, and collaborate with respect to public policy, knowledge transfer, funding, and commercialization issues. A team of “implementation champions” will include the director of the Fusion Center, a current or past national Congressional delegate of considerable prominence, Kansas-based military leadership, economic development spokespersons, key university administrators, and current state leadership in food safety and security and animal health. Such champions and other key stakeholders might even be organized into a Fusion Center Advisory Council.

## **Resource requirements**

Leadership requirements would include a full-time Fusion Center Director, dedicated program leaders, as well as new faculty and other human resource positions, such as support staff and/or liaison support from industry, government, academia, KansasBio and the Bioscience Authority. In conjunction with technical experts, the Fusion Center staff will coordinate and promote business partnering and encourage economic development.

A physical location for the Center would be required; one consideration would be to locate the Center in a major metropolitan area, such as the Kansas City region, to allow better opportunities for attracting staff and talent. Other infrastructure, both physical and virtual, could be at various satellite locations (e.g., animal health centered at one institution/site, food safety at another, etc.). Significant enhancement and/or operational support of food safety and security research facilities (including the BRI) and information-technology systems represent critical infrastructure needs. IT systems would be required for accumulating, storing, and tracking the dissemination of resources and information.

Capital resources would be obtained through state and federal funding, membership, private donations, etc. Specific entities might include the Bioscience Authority, Stowers Foundation, Kaufman Foundation, NISTAC, NIHS, universities, and private industry.

To help identify resources, Congressional offices and private associations (e.g., the Animal Health Institute) will be consulted about the availability of grants relevant to this economic-development initiative. In addition to the Department of Homeland Security and USDA, there may be less-well-known but sizeable grant programs.

The reputation (branding) of the Center would be established and expanded through scientific journals, industry publications, academic symposia, and through involvement with the Kansas Bioscience Authority and national bioscience efforts (see <http://www.bio.org>). The Fusion Center, along with other technical experts, will facilitate individual companies in their development of food safety related branding/marketing strategies, backed by sophisticated, robust, documented risk management programs.

## **Sustaining the initiative**

The initiative will be sustained through the continued involvement/collaboration of industry, government and academia. An additional assumption is that the Kansas Bioscience Authority will be the Center's major patron. The Center would be highly visible with its focus based primarily on education and information (including networking). The Center should be structured so that its activities have the potential to generate revenues to achieve partial self-funding in addition to the previously mentioned support. The Center would be somewhat immune to claims of corporate welfare based on participant and funding diversity.

The state's institutions of higher education would all have the opportunity to participate and collaborate. An example of collaboration and sustaining support would be the attraction of bioscience-oriented companies that partner with the unique BRI biosafety level 3 facility at KSU to conduct state-of-the-art animal health and food safety and security research. Another partnership venture will be the Tele-Veterinary Medicine System, a state-wide sensor information system to provide real-time monitoring, reporting, storage, and analysis of animal food chain biological risks. Finally, the expertise and commercial clout of the state's animal health businesses will be required. In the end, all the major Kansas constituencies can participate and benefit.

## **Sustaining the initiative – support and revenue generation**

The not-for-profit **Fusion Center** will serve as a provider of information, including the synthesis, from existing scientifically credible sources, of issue-focused answers and knowledge gaps. To partially support that activity, a service fee will be received from users of the Fusion Center. Base funding of **\$1.5 M per year** from the Kansas Bioscience Authority will provide for the Center a Director (a world-class scientist/communication expert in animal, plant, and human health issues), other support scientists (rising stars), as well as office space and related IT support. The Bioscience Authority's investment would leverage infrastructure support at Kansas educational institutions, among others. It is anticipated that service-fee income will grow over time as the Fusion Center's reputation and transdisciplinary assistance to clientele are recognized. Additionally, the recognition of the Fusion Center as a credible information source will encourage bioscience based businesses to locate in Kansas.

KSU has a long standing track record of validating animal and plant production practices as well as food product processing practices that ensure **food safety**. The BRI at KSU has integrated the ability to validate those production and processing practices into a one-of-a-kind-in-the-world biosafety level 3 facility. The BRI provides industry and government with a facility to conduct integrated production-to-consumption research. Once clients use the BRI they will also be encouraged to locate near that facility, which is part of the KSU food safety and security complex devoted to animal, plant, and human health. KSU has world-class scientists to lead this effort. However, 4 additional rising star scientists will be required. Salary fringes and annual support for those positions is **\$1.2M per year**.

Similar (**\$1.2M per year**) resources for **animal health** rising stars are envisaged.

With respect to the Tele-Veterinary Medicine System, it is expected that cost savings from reduced animal food disease containment should produce more profit for the Kansas animal food industries. Therefore, sustained support of the Tele-Veterinary Medicine System would be at least partially funded by animal food industries of Kansas. Sustained support might include the fee-based interpretation and dissemination of information acquired by the System.

Total base-funding and sustaining resource requirements, excluding the costs of the Tele-Veterinary Medicine System, are **\$3.9M per year**.

## **Performance metrics**

As the reputation and prestige of the Center grows, opportunities to parlay the assets into enhanced commercial or educational endeavors will arise, resulting in additional revenues to businesses and increased research funding to universities. The Center and the enhanced research activities associated with it will bring additional talent to area businesses and educational institutions. The Center will seek to foster business-friendly mechanisms of collaboration between industry and academia thereby creating in Kansas an attractive incubator setting for bio-related businesses.

Performance metrics for the **Fusion Center** in general include:

- a) New company start-ups in Kansas from university spinouts, corporate spinouts, entrepreneurial founding;
- b) Expansion of current bio-related businesses in Kansas and relocation of existing companies to Kansas;
- c) Increased "brain gain" of scientists, managers, entrepreneurs, faculty, & students;

- d) Enhanced university-industry relationships through increased contract research dollars, endowed chairs, royalty and licensing fees;
- e) Increased number of high-skilled, high-paying bio-related jobs;
- f) Number of persons, businesses, or governmental organizations patronizing the Center;
- g) Increased federal and industry research funds directed to Kansas (e.g., SBIR or ATP funding increases, federally-funded research center or line-item appropriations);
- h) Increased investments (including venture-capital investments) in food safety, animal health, and other Center-sponsored projects; and
- i) Increased enrollment at institutions of higher education in science and bio-related disciplines.

Additional performance metrics specific to the **food safety** component include:

- a) Creation of new global partnerships that will make Kansas a bona fide global hub for food safety research and technology/information transfer;
- b) Attraction to Kansas of first-class international conferences and forums; and
- c) Increased number and prominence of branding/marketing programs.

Additional performance metrics specific to the **animal health** component include:

- a) Enhanced profitability of businesses related to animal agriculture and animal health;
- b) Improved disease management;
- c) Increased advanced degrees in the animal health field; and
- d) Increased number of Kansas students hired by the animal health industry.
- e) National leader in tele-veterinary medicine
- f) Improved image of Kansas as a supplier of safe and secure animal foods
- g) Identification, surveillance, and containment of disease in food animals