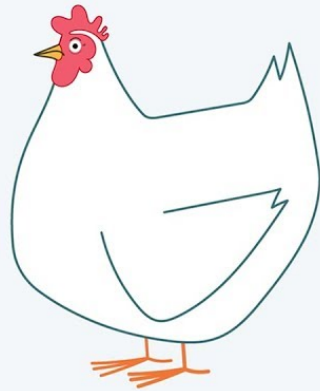HISTORY THROUGH THE
EYES OF A CHICKEN

History

"I believe that the more you know about the past, the better you are prepared for the future."

Theodore Roosevelt

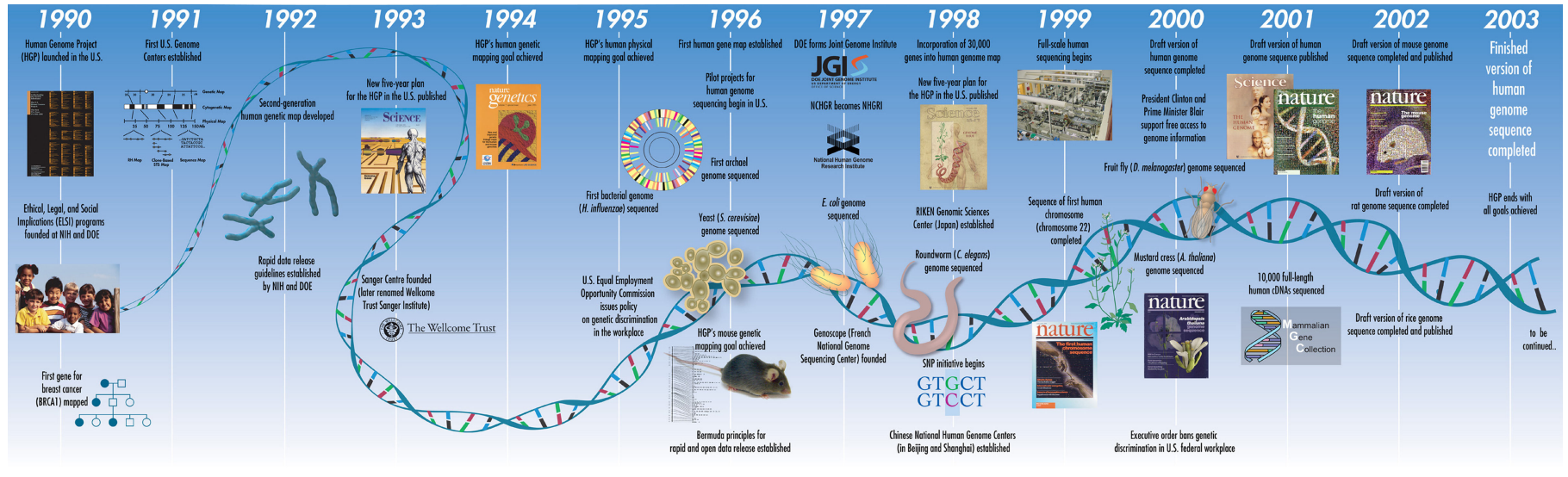# *Blueprint*
for USDA Efforts
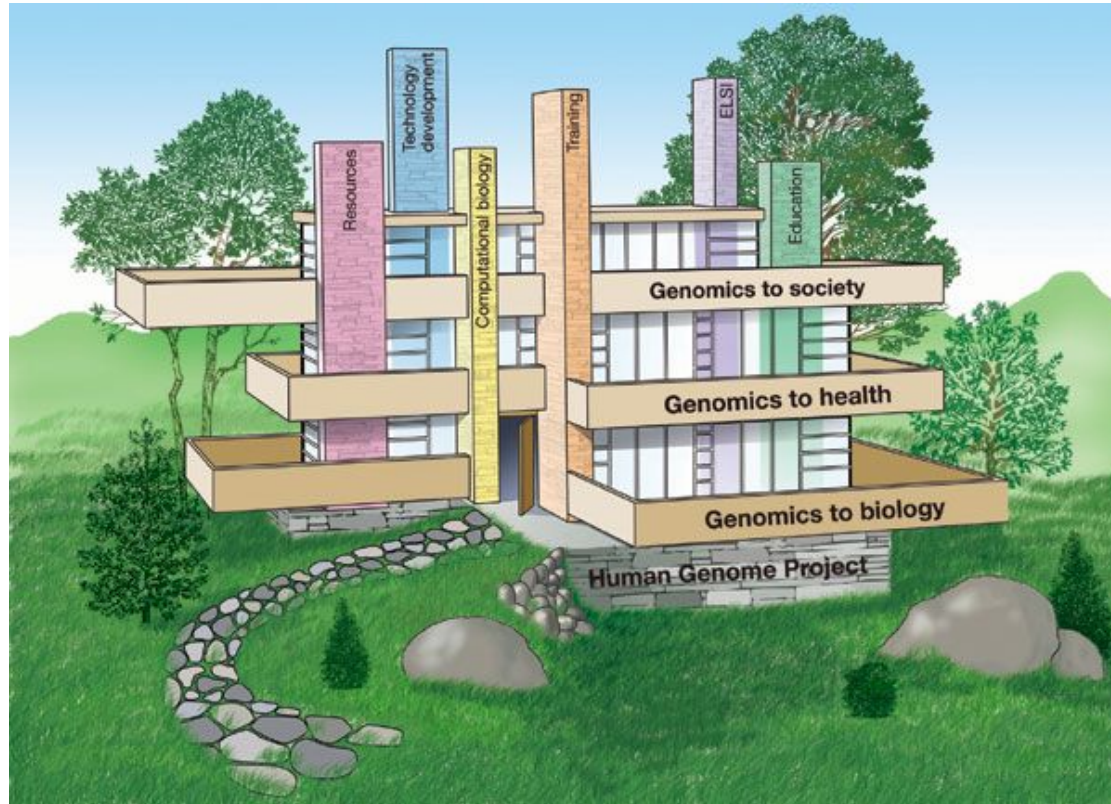# in Agricultural Animal Genomics
2008-2017

May 18, 2007

Human Genome Project
- $3 billion from NIH and DOE

2003 – NIH Blueprint for Genomics

Task force was convened by USDA Undersecretary Dr. Jen on February 16, 2006

1. The group will convene for a "drafting" meeting. It is expected that an initial draft of the strategic plan will result from this session.

2. It was the desire of the group to do as much "lead-in" work as possible before the April session. **Green and Qureshi** were charged to develop a plan to facilitate this pre-work ...

3. A Joint EC-US Workshop is being planned under the auspices of the Joint EC-US Task Force on Biotechnology...Green and Burfening are the US leads in the planning of the event...it was suggested that this workshop should also be an interface point for the task force.

USDA Animal Genomics Strategic Plan Task Force

17 – 21 April 2006

USDA George Washington Carver Center
5601 Sunnyside Avenue
Beltsville, Maryland

Objective: To develop an initial detailed structure and outline of a USDA Strategic Plan for research and education in animal genomics.

Task Force Members:

Ronnie D. Green, USDA-ARS-NPS, Chair
Muquarrab Qureshi, USDA-CSREES-PAS, Co-Chair
Peter Burfening, USDA-CSREES-NRI
Hans Cheng, USDA-ARS, East Lansing, MI
Noelle Cockett, Utah State University
Deb Hamernik, USDA-CSREES-PAS
Mark Mirando, USDA-CSREES-NRI
Daniel Pomp, University of North Carolina-Chapel Hill
Gary Rohrer, USDA-ARS, Clay Center, NE
Curt Van Tassell, USDA-ARS, Beltsville, MD
Jim Womack, Texas A&M University
Steven Kappes, USDA-ARS-NPS (Ex-Officio)
Anna Palmisano, USDA-CSREES-CGP (Ex-Officio)

Science to Practice Priorities

1. Whole-genome-enabled animal selection.
2. Prediction of genetic merit of individual animals from genome-based data combined with phenotypes.
3. Integration of genomic data into large scale genetic evaluation programs and the use of genomic information to design precision mating systems.
4. Precision management systems to optimize animal production, health, and well-being.
5. Genomic capabilities that enable parentage and identity verification (traceability).

Discovery Science

1. Identify genes and gene products that regulate important traits in agricultural animals such as disease resistance, animal well-being, feed efficiency, and product quality.

2. Understand mechanisms that regulate agriculturally relevant genes in a systems biology framework.

3. Define the mechanisms through which specific genes and genetic variation influence phenotypes and phenotypic variation.

4. Understand the roles and interactions of host animal and microbial genomes and environmental influences (e.g., animal feed, vaccines) for improving animal health, well-being, and production efficiency.

Infrastructure

1. Genomic tools to connect genotype to phenotype and elucidate pathways of complex traits for all agricultural animal species, e.g., comprehensive, high resolution genome maps and assembled and annotated genomic sequences.

2. National, comprehensive databases and the statistical and bioinformatics tools that integrate genomic, phenotypic, and experimental information for each species.

3. Genetic resources such as centralized animal populations that are deeply phenotyped as well as repositories for cell lines, DNA and RNA collections, and gene expression resources for all species. National Animal Germplasm Program should be broadened to become a coordinated national repository for genomic DNA, appropriate DNA libraries, and specialized cell lines.

4. Education and training of students, scientists, and the public on genome-enabled animal science and opportunities that help prepare the next generation of scientists.

Tangible Products – CSREES (NIFA) RFAs

43.0 Animal Genome (E): Whole Genome Enabled Animal Selection

National Program Leaders –

      Dr. Peter J. Burfening (202-401-5823 or pburfening@csrees.usda.gov)

      Dr. Muquarrab Qureshi (202-401-4895 or mqureshi@csrees.usda.gov)

Total Program Funds – approximately $5.0 million over five years

Proposed Budget Requests –

- Proposed research project budget requests must not exceed $1.25 million per year for up to 4 years in duration for a total request of $5.0 million (including indirect costs). It is anticipated that one award will be made for this program element.
- Requests exceeding the budgetary guidelines above will be returned without review.

Letter of Intent – Due by November 26, 2007 (5:00 P.M., ET); see the **Other Key Information** section for format and submission instructions.

Application Deadline – February 14, 2008 (5:00 P.M., ET)

Other Funding Agencies?

Perspectives in Comparative Genomics & Evolution

The reason for this meeting is to obtain a big picture look at the current state of the field of comparative genomics with a focus on commonalities across genomic investigations into humans, model organisms (both traditional and non-traditional), agricultural species, wildlife species (and microbes). Outcomes will be threefold: 1) identify areas of synergy; 2) identify gaps in knowledge and resources that need attention and development; 3) recommend areas of focus for comparative genomics as a whole, and specifically to NHGRI with relevance to understanding human health and disease. What part of this field (if any) belongs with NHGRI and would be at the "forefront" of comparative genomics?

Parting Philosophical Thought

Introducing a new technology alone is never enough. The big spurts in productivity come when a new technology is combined with new ways of doing business…

Thomas L. Friedman

The World Is Flat