Innovation in Colorado Agriculture: Looking Forward
“...an unprecedented effort to engage every county in Colorado on how best to improve the state’s economy...”

- Gov. John Hickenlooper
1. Build a Business-friendly Environment
2. Recruit, Retain, and Grow Companies
3. Improve Access to Capital
4. Create and Market a Stronger Colorado Brand
5. Educate and Train the Workforce of the Future
6. Cultivate Innovation and Technology
Core Objective:
Foster innovation and new technology

Geography may hold a key to innovation in food and agriculture in Colorado, given close proximity and high concentrations of:
- Agricultural production and processing;
- Research institutions;
- Innovative food product development and ag technology companies;
- Top talent;
- Discerning consumers.

All of the elements needed for the emergence of an innovation cluster.

Top 25 assignees of Colorado patents in agriculture and food related technologies
EMERGENCE OF AN AG INNOVATION CLUSTER IN COLORADO
What is an innovation-led cluster?

“A geographically proximate group of interconnected companies and associated institutions in a particular field, linked by various commonalities and complementarities.”

- Michael Porter

“Co-location of different stakeholders accelerates knowledge-sharing and development of new products and services in ways that you can’t do if they’re scattered.”

- Navi Radjou
Data searches

**Web Of Science search:**
CO authors in
- Agriculture
- Agronomy
- Entomology
- Food
- Horticulture
- Plant Science
- Soil Science
- Veterinary Science
- Water

→ 14,982 scientific articles

**US Patent Office search:**
CO inventors in
- Agriculture; Animal Husbandry
- Baking; Dough
- Butchering; Meat
- Food/Beverage Equipment
- Veterinary Instruments/Methods
- Milling
- Packaging/Storing/Handling
- Water treatment
- Fertilizers
- Proteins
- Pyrolysis
- Extraction from waste
- Oils/Fatty Acids
- Brewing/Fermentation
- Pasteurization/Preservation
- Enzymology/Microbiology
- Genetic Engineering (Plants)
- Ethanol/Butanol
- Sugar
- Hides/Leather
- Hydraulic Engineering

→ 5,005 US patents
WebOfScience articles and patented inventions

WebOfScience articles with a Colorado author... ...isolating those with a CSU author.
WebOfScience articles and patented inventions

WebOfScience articles with a Colorado author...

Patent applications with a Colorado inventor...
Patents by Colorado inventors in five interrelated technology categories
9 counties in Northern Front Range:

- 66% of Colorado population
- 11% of Colorado area
- 12% of Colorado farm land
- 30% of value of ag production
- 51% of value of ag inputs
- 81% of value of commodity marketing/processing
What contributes to development of an innovation-led industry cluster?

- **Talent** is key
- Quality of workforce:
  - University training of specialist skills
  - Culture and quality of life
  - Multiple employers with related focus attract talent to the region
  - If a worker loses one job, finds another similar employer nearby.
What contributes to development of an innovation-led industry cluster?

• Proximity and community:
  – Lower costs of meeting
  – Higher rates of incidental contact
  – Ideas flow fastest in a local community
  – Competition felt more quickly

• Culture and environment:
  – Tolerance of different opinions, creativity, risk-taking
  – Fostering collaboration
Drawbacks to development of an innovation-led cluster

• If regions firms dispersed across different industries
• If dominance by a few large firms
• If workers lose employment and have to leave region to find similar work
• If lack of trust creates higher social transaction costs
• If firms are attracted out of region
Next Steps