



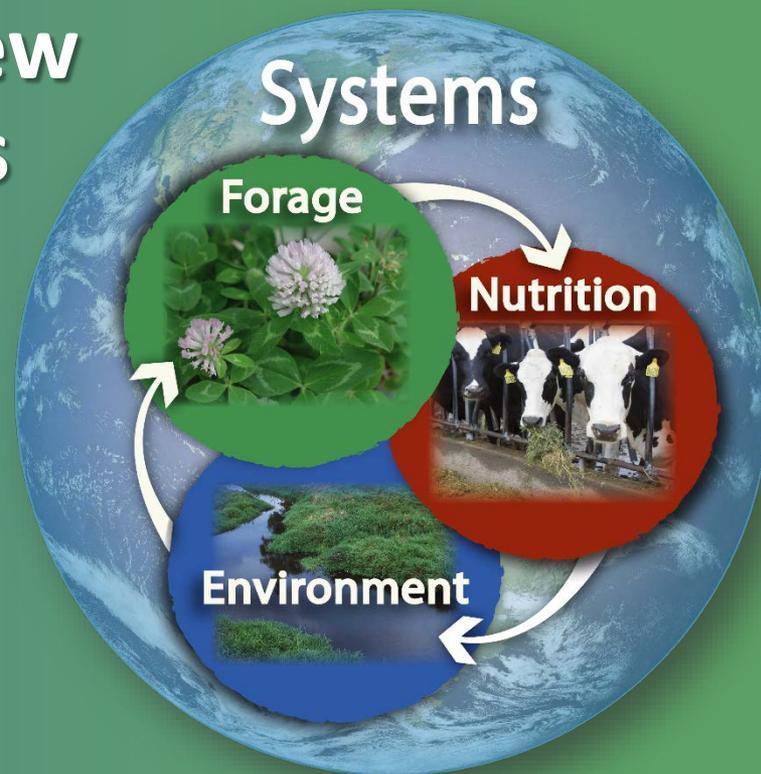
United States Department of Agriculture

USDFRC and AGIL Overview NP101 Dairy Stakeholders

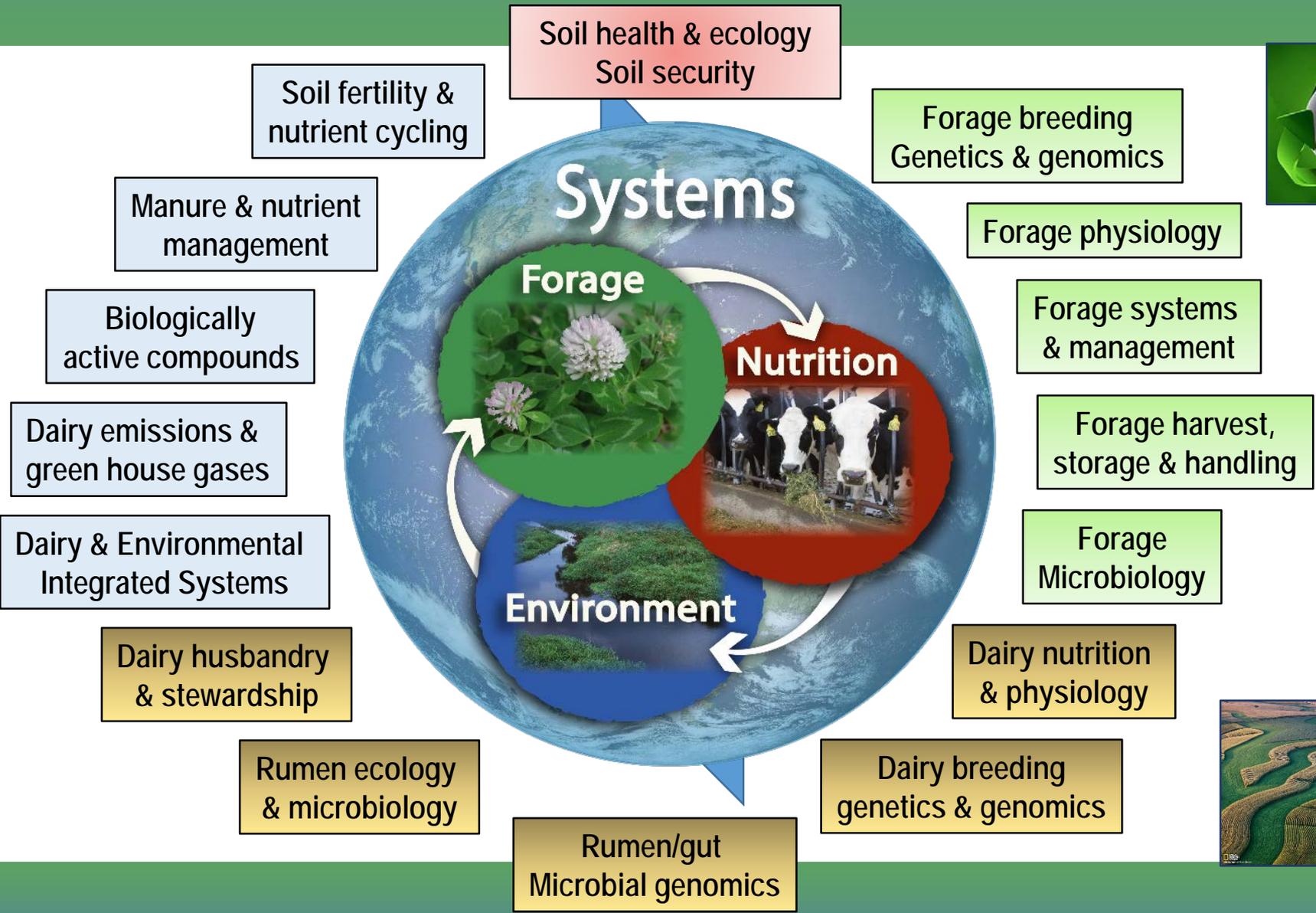
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USDFRC Integrated Dairy Research:



USDFRC Research Priorities

- Focus on integrated dairy system optimized on a landscape scale (watershed, county, state, etc.)
- Understanding GEMS factors: Genetics x Environment x Management x Socio-economic
 - Extraordinary complexity – relationships and interactions
 - Focus on optimization/efficiency, resource balance, and ecosystem services
 - Building highly effective teams – extensive partnerships
- Research Priorities:
 - Soil health/quality/resiliency
 - Carbon and nitrogen cycling
 - Cover crops
 - Manure and soil organic matter
 - Forage and cropping systems
 - Improved annual crop systems and alternatives
 - Improved forages and alternative forages
 - Cover crops
 - Perennials
 - Dairy nutrition
 - Feed/nutrient utilization efficiency
 - Improved/adapted genetics
 - Metabolic size and production efficiencies
 - Environmental sustainability
 - C, N and P cycling – water quality
 - Reactive N in dairy systems
 - Pathogens and biologically active compounds



AGIL Research Priorities (I)

- **Develop improved methods for genetic improvement and conduct genomics-based research to improve the health and productive efficiency of dairy animals and small ruminants**
- **Research Priorities:**
 - **Enhance selection in ruminant populations**
 - Develop biological resources and computational tools
 - Integrate traditional, quantitative-based selection methods with DNA marker-based tools
 - Characterize functional genetic variation for improved fertility and environmental sustainability

AGIL Research Priorities (II)

- **Improve productive efficiency of dairy animals**
 - Expand national and international collection of phenotypic and genotypic data
 - Develop a more accurate genomic evaluation system
 - Use economic analysis to maximize genetic progress and financial benefits from collected data
- **Understand genetic and physiological factors affecting nutrient use efficiency of dairy cattle**
 - Evaluate measures of nutrient use efficiency in dairy heifers and lactating cattle
 - Determine relationships of rumen microbial communities, animal genotype, and methane production with nutrient use efficiency and lactation performance
 - Identify effects of diet on overall animal energetic efficiency

Stakeholder Question #1

Genetic and genomic evaluation programs and techniques are advancing rapidly and new technologies such as gene editing promise to provide additional extraordinary impacts. Consequently:

- a. What do you see as the top genetic or genomic opportunities and/or challenges for the dairy industry over the near term? Long term?
- b. Which new or emerging traits will be most important for the industry to address in the near term?
- c. In light of population growth predictions and the changing effects of climate change, how must the dairy cow evolve to best fit the dairy industry going forward?

Stakeholder Question #2

As the use of new technologies on the farm grows there is an increasing need to incorporate those data into both management and genetic improvement programs. Consequently:

- a. What major changes do you anticipate in the near term that will affect how you manage your cattle?
- b. What information is needed to support efficient management decision-making on modern dairies?
 - i. Is too little or too much information available?
 - ii. Are existing management reports and summaries available through the DHI system sufficient for your needs?
- c. Do the tools provided for ranking animals based on genetic merit and assigning bulls to cows for mating meet your needs? Is it more important to have tools for assigning individual bulls to groups of cows (rather than individuals) to better reflect how large dairies manage their reproduction programs?
- d. Are different management and selection tools needed by large and small dairies?

Stakeholder Question #3

Nutritional programs are also evolving and rations and feeding programs are becoming more sophisticated. However, nutritional issues and feed costs still represent the highest costs of production for the dairy industry. Consequently:

- a. What are the top opportunities for producers to mitigate feed costs over the near term? Long term?
- b. What new feedstuffs or ration management practices are emerging that may benefit the dairy industry?
- c. How do new and/or conventional forages need to change or evolve to meet the future needs of the dairy industry?
- d. How will TMRs be developed and managed to better meet the nutritional requirements for animals in all stages of growth, development and maturity? What technologies or information is needed?

Stakeholder Question #4

- We have learned an extraordinary amount about the microbial communities and their function in the cow gut and rumen. However, there is a great deal yet that we need to better understand about the role of these communities on health, production and efficiency. Consequently:
 - a. What are your perceptions regarding the role of the microbial communities on cow health, production and efficiency?
 - b. What are the top research priorities for the dairy industry going forward relating to the microbial communities in the cow rumen and gut?

Stakeholder Question #5

Today, the dairy industry is addressing several environmental issues including air and water quality, nitrogen and phosphorus management, manure management and soil health, and pathogens and biologically active compounds. Consequently:

- a. What are our top opportunities to better develop and manage the dairy cow to lessen her impact on the environment? Or better yet, provide ecosystem services?
- b. Which of the current environmental challenges currently facing the dairy industry should be prioritized for future research to provide industry solutions? Are there any new or emerging environmental issues or concerns?
- c. How will the effects of climate change impact the dairy industry over the near term? Long term? Will climate change effects be similar for dairies across the US?

Stakeholder Question #6

What other dairy cow production related issues or concerns do you have for the dairy industry?

For example; socio-economic factors such as animal welfare, housing systems, consumer demands for dairy products, etc.; or other environmental or production related issues?