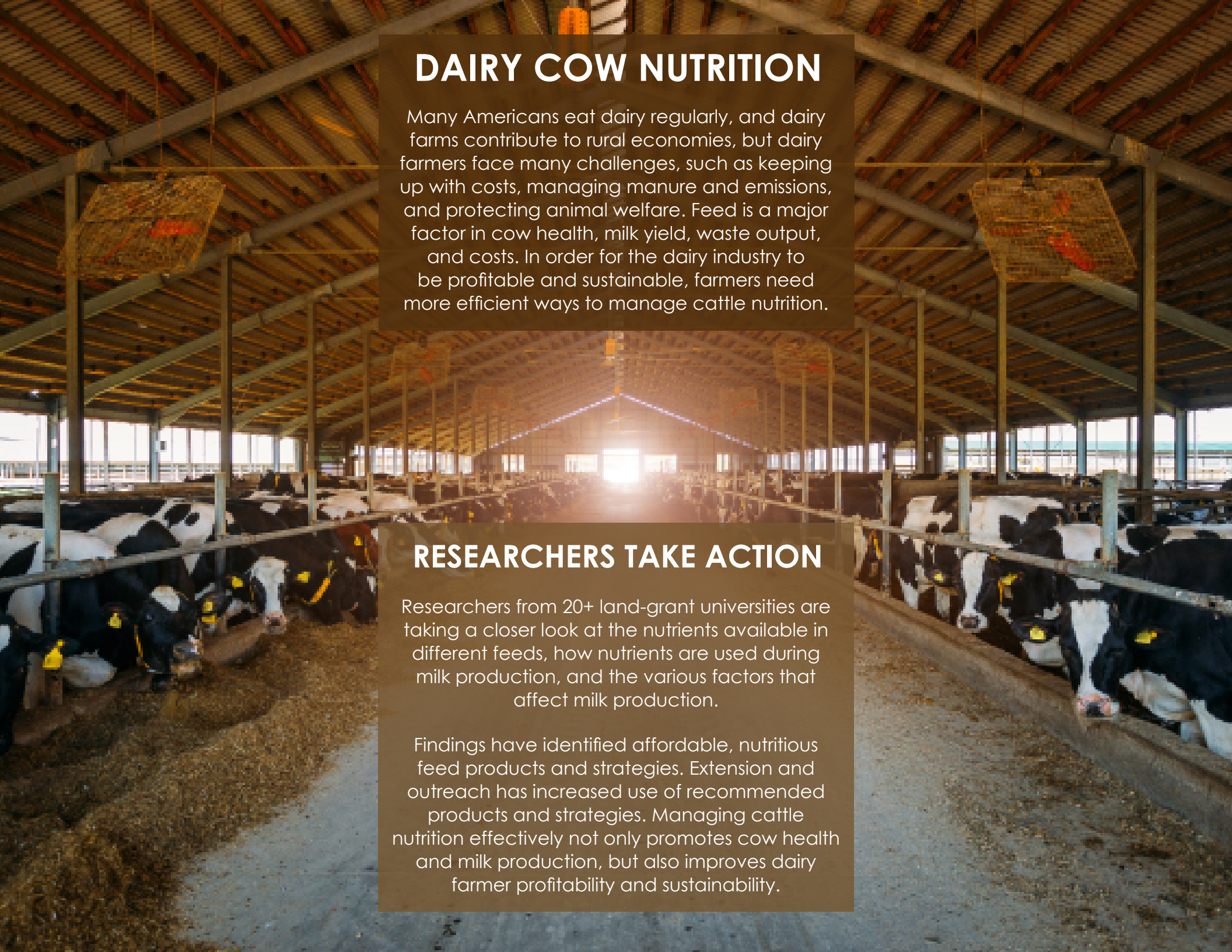

DAIRY COW NUTRITION

Many Americans eat dairy regularly, and dairy farms contribute to rural economies, but dairy farmers face many challenges, such as keeping up with costs, managing manure and emissions, and protecting animal welfare. Feed is a major factor in cow health, milk yield, waste output, and costs. In order for the dairy industry to be profitable and sustainable, farmers need more efficient ways to manage cattle nutrition.

RESEARCHERS TAKE ACTION

Researchers from 20+ land-grant universities are taking a closer look at the nutrients available in different feeds, how nutrients are used during milk production, and the various factors that affect milk production.

Findings have identified affordable, nutritious feed products and strategies. Extension and outreach has increased use of recommended products and strategies. Managing cattle nutrition effectively not only promotes cow health and milk production, but also improves dairy farmer profitability and sustainability.

RESEARCH HIGHLIGHTS

- Computed the nutrient requirements of lactating dairy cows
- Developed new equations to predict the digestibility of nutrients
- Examined the ***bioavailability*** of amino acids in feed ingredients and showed how they are distributed in the body after absorption
- Found ways to prime the rumen to improve digestion, nutrient absorption, and animal health when changes are made to cow diets
- Found that adding high-moisture corn to alfalfa hay-based diets could improve nutrient absorption and ***feed efficiency***
- Identified the genetic basis of feed efficiency in dairy cattle, which could help breed cattle with higher feed efficiency
- Found ways to relieve inflammation and boost milk yield
- Discovered that lowering dietary crude protein can improve milk production efficiency in heat-stressed dairy cows
- Demonstrated that canola meal protein supplements can boost milk production
- Updated the Molly cow model to more accurately predict fecal and urinary nitrogen and methane outputs
- Identified feeds that can reduce ammonia and methane emissions and are suitable for high-producing dairy cows
- Showed that feed made with crop residues, winter cover crops, and agro-industrial byproducts (like soybean hulls and distillers' grains) support high milk yields, are affordable, and don't require additional land to grow
- Identified and increased use of feed components that support immunity, prevent disease, and promote efficient milk production
- Created a low-cost, easy way to monitor for ketosis, which can decrease milk production and cause other health issues and production challenges
- Showed that important changes in cows' bodies, which help them use energy efficiently before/after calving, are due to decreases in hormones
- Involved graduate and undergraduate students in projects and national meetings, training the next generation of dairy scientists and farmers

Bioavailability is the fraction of a nutrient that is actually absorbed and used.

Feed efficiency refers to the pounds of milk produced per pound of feed consumed.

THE MULTISTATE APPROACH

Working together, scientists have been able to integrate new technology and information from multiple disciplines and test solutions in diverse settings. This group's research is recognized worldwide. Over the past five years, members have leveraged significant private and federal resources. Six members were appointed to write the latest edition of the National Research Council's Nutrient Requirements of Dairy Cattle.

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