

High Digestibility Sorghum Hybrids for Enhanced Protein Content and Nutritional Value in Silage Applications

Single-locus sorghum hybrids deliver ~65% higher protein digestibility at standard yields, upgrading silage nutrition for ruminants.

Sorghum is an internationally popular agricultural product that has been gaining traction as a food and fodder crop in recent decades. The crop is well-adapted to drought conditions compared to corn, contributing to its growing popularity in climate-stressed environments. Sorghum-based silage is particularly useful as fodder in the production of animal products such as beef and dairy products. However, sorghum's protein digestibility lags behind other crops due to variations in protein body structure, which impacts its viability for use in silage and animal feed in general.

To meet this growing interest, researchers at Purdue University have developed sorghum hybrids with significantly higher protein digestibility than typical varieties. With only a single genetic manipulation, these researchers have increased protein digestibility in their sorghum by 65% compared to conventional varieties. With such an enormous increase in available protein, this novel variety promises to increase the nutritional value of sorghum as a silage product. More protein-rich animal feed will improve livestock quality while saving on feed volume and amino acid supplements. This discovery will serve as a step-change technology for improvement of sorghum quality worldwide.

Technology Validation:

Field trials showed that the highly digestible protein (HDP) silage hybrids exhibited similar biomass yields to conventional sorghum hybrids; however, the HDP hybrids exhibited significantly improved protein content and protein digestibility. Protein digestibility in the HDP hybrids was 65% higher than the conventional silage check.

Advantages:

Technology ID

2024-TUIN-70670

Category

Agriculture, Nutrition, &
AgTech/Precision Agriculture &
Smart Farming
Agriculture, Nutrition, &
AgTech/Crop Genetics &
Breeding
Agriculture, Nutrition, &
AgTech/Livestock & Animal
Health Solutions

Authors

Mitchell Reed Tuinstra

Further information

Abhijit Karve

AAKarve@prf.org

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- Provides significantly higher protein digestibility than normal sorghum
- Genetic markers and NIRS phenotyping technologies have been developed for this trait to facilitate easy manipulation in silage breeding programs
- Boosts nutritional value of sorghum by increasing protein digestibility 65%

Applications:

- Sorghum seed companies
- Sorghum breeding
- Sorghum cultivation
- Animal and human nutrition
- Livestock feed, particularly silage-dependent ruminants like cows and sheep

TRL: 4

Intellectual Property:

Provisional-Patent, 2024-03-28, United States

PCT-Patent, 2025-03-27, WO

Keywords: high digestibility sorghum,protein enhanced forage,sorghum silage improvement,livestock feed efficiency,ruminant nutrition upgrade,genetic trait sorghum,low input animal feed,amino acid rich fodder,climate resilient crops,high protein biomass,sorghum breeding innovation,sustainable feed solutions