

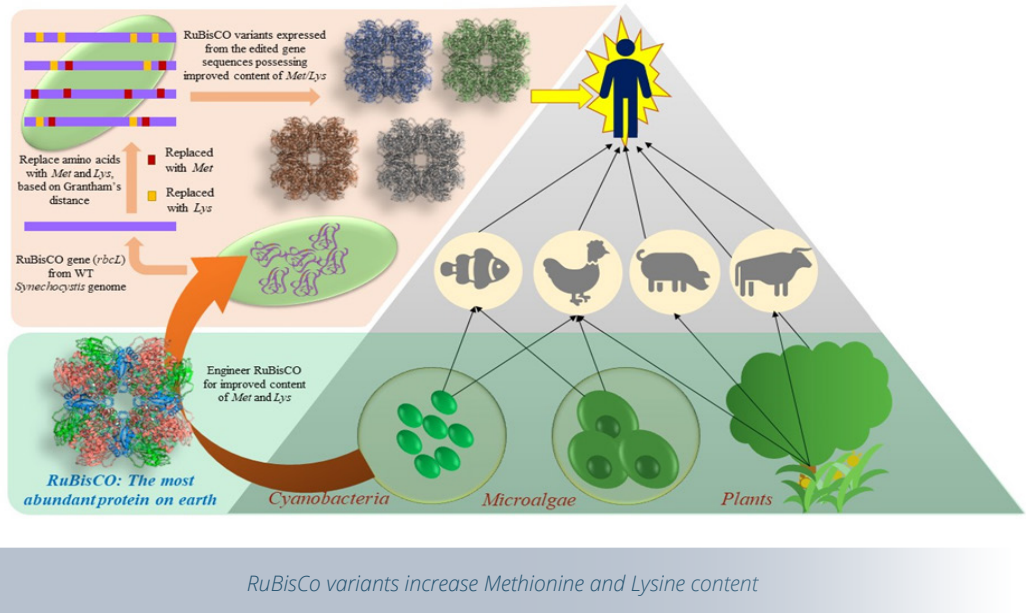
Patent Pending
SD 15512

Technology Readiness Level: 4

Key elements demonstrated in laboratory environment

A high-quality feedstock to address scaling and sustainability challenges associated with the growing global demand for protein.

Global demand for high quality digestible protein is expected to substantially outpace population growth over the coming decades. RuBisCo (Ribulose-1,5-bisphosphate carboxylase-oxygenase) is the photosynthetic enzyme in the green leaves of plants and is the most abundant soluble protein on Earth. In addition, RuBisCo is easy to extract and highly digestible. Although RuBisCo is already considered a nearly complete protein source, significant improvements are possible by increasing the incorporation of two key amino acids, methionine (Met) and lysine (Lys), which are typically limiting and costly for a variety of feed applications.



Researchers at Sandia National Laboratories have used codon swaps to increase the relative abundance of both Methionine and Lysine by an order of two. This process leads to a significantly improved amino acid score and a more efficient protein source, producing new high-quality protein feedstocks to supplement existing agriculture. This technology can be utilized by the plant-based protein industry, especially with the growing consumer preference for plant-based protein and waning support for animal-based protein. The genetically modified RuBisCo will help address the scaling and sustainability issues associated with the growing global demand for protein.

TECHNICAL BENEFITS

- Improved amino acid score
- Enrichment of Methionine and Lysine
- Reduce global protein deficiency

INDUSTRIES & APPLICATIONS

- Plant-based protein industry
- Genetic engineering
- Algae