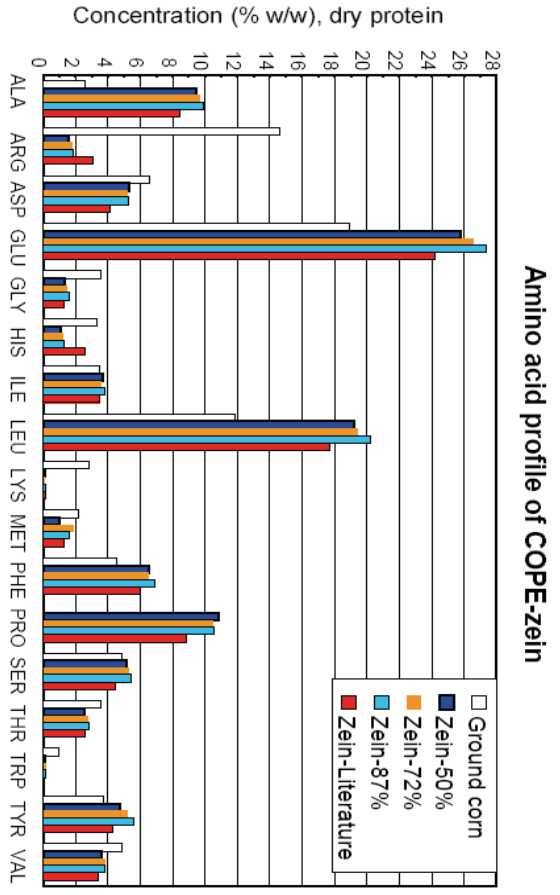
PRAIRIE GOLD, INC.

Prairie Gold, Inc., established in 2006, is commercializing a series of unique technologies for producing high-value coproducts from corn. Our signature technology is the COPE (Corn Oil and Protein Extraction) process which uses in-house ethanol from an ethanol plant to extract zein prior to fermentation. Because COPE-zein has not been exposed to the steeping chemicals and processing steps used for CGM, it is in a more "natural" state and thus has better functionality for certain applications.

Quality aspects have been confirmed by extensive testing using electrophoresis, HPLC, amino acid profiles and evaluations by potential customers. The quality and functional properties of COPE-zein is equivalent or superior to zein produced by traditional methods. COPE can produce several grades of zein simultaneously, containing 50% protein to 90%+ protein (dry basis) and with varying amounts of color (xanthophylls). Typical amino acid profiles of several grades of COPE-zein are shown in the figure below. Data for whole corn and from published literature are shown for comparison.



ZEIN APPLICATIONS

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PRAIRIE GOLD, INC.

Bioproducts from Corn

ZEIN

THE INDUSTRIAL POLYMER FOR THE 21ST CENTURY

Biodegradable

Renewable

Natural

THE WIDE WORLD OF ZEIN APPLICATIONS

What is zein?

Zein is a group of alcohol-soluble proteins in corn (maize). It was first documented in 1821 and is the subject of over 4400 world-wide patents based on a wide variety of applications in the environmental, chemical, metallurgical, food, medical, pharmaceutical and biotechnology industries. Zein has been produced commercially since the 1930s and has been used as a coating for paper cups, candies, nuts, enriched rice and dried fruits; for lining soda bottle caps; for encapsulating flavors, sweeteners and time-release ingredients; photo films; fabrics (e.g., *Vicara,* a wool-like material); paper and printing inks. There has been an explosion of interest in natural bio-based polymers in recent years, and zein's unique characteristics and functional properties can meet the challenges of the 21st century for biocompatible and "green" materials from renewable sources.

What can zein do?

Food and Medical Uses

- Used as a coating and as a product for encapsulation for flavor and medicine
- It has good resistance to microorganisms, heat and humidity and can conceal the taste and odors of a pharmaceutical
- Used as a fat-mimic to replace 50-100% of the fat in mayonnaise, ice cream and spreads. Zein hydrolyzates have very high water-binding capacity and can inhibit (ACE) activity which reduce blood pressure.

Food Preservation and Packaging

Drug Delivery

Gums and Coatings

- Excellent shellac substitute, from candy coatings to paint additives. Shellac is an animal protein secreted by insects (Laccifer lacca).
- Chewing gum base will not stick to shoes, carpet, a child's hair or a school desk.
- It is biodegradable and has "GRAS" status

Chewing Gum Base

Films and Packaging

- Zein forms excellent films and coatings due to its unusual solubility pattern and structure
- Made by blown extrusion
- Films are thin (200 microns)
- Flexible
- Glossy
- Translucent
- Transparent
- Low permeabilities to oxygen and carbon dioxide
- Can form an edible moisture barrier on fruits and vegetables to extend shelf life three weeks and up to three months for mushrooms and fresh pasta
- Edible hay bale wraps for the livestock industry
- Horticulture mulches and ground cover
- Unlike plastic, zein sheets are biodegradable which means reduced labor and disposal problems. Biodegrade in the soil and acts as a slow-release nitrogen source.

Tissue Engineering

Biodegradable Packaging

Edible Hay Wraps

Industrial Uses

- Make biodegradable polymers using bio-based plasticizers such as fatty acids and vegetable oils.
- Grease or water resistant
- A natural adhesive and binder
- With a cross-linking agent can be compression-molded to produce water resistant plastics
- Can be used to make bottles, pipes, rods, laminates, sacks and bags
- Used to coat aircraft engines, as a support for electrophoretic deposition of brazing materials with conducting polymers successfully provide electromagnetic applications
- Forms brick-like nanostructures which can be used as a framework for growing human skin cells. This technology is useful for wound dressings for burn victims.

Zein Fiber for Clothing

Ink